Assessment of Service Quality of Bangladesh Telegraph and Telephone Board (BTTB) and Possible Improvements

A Thesis By

Mamun Monzurul Aziz

DEPARTMENT OF INDUSTRIAL & PRODUCTION ENGINEERING (IPE)
BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY
(BUET)
DHAKA, BANGLADESH

Assessment of Service Quality of Bangladesh Telegraph and Telephone Board (BTTB) and Possible Improvements

A Thesis By

Mamun Monzurul Aziz

Student No. 040308105(P)

Submitted on the Department of Industrial & Production Engineering (IPE), Bangladesh University of Engineering and Technology (BUET), Dhaka, in partial fulfillment of the requirements for the degree of Master of Engineering in Advanced Engineering Management (AEM)

December, 2005

DEPARTMENT OF INDUSTRIAL & PRODUCTION ENGINEERING (IPE)
BANGLADESH UNIVERSITY OF ENGINEERING AND TECHNOLOGY (BUET)
DHAKA, BANGLADESH

The thesis titled "Assessment of Service Quality of Bangladesh Telegraph and Telephone Board (BTTB) and Possible Improvements" submitted by Mamun Monzurul Aziz, Student No. 040308105(P), Session- April 2003, has been accepted as satisfactory in partial fulfillment of the requirements for the degree of Master of Engineering Advanced Engineering Management (AEM) on December 2005.

BOARD OF EXAMINERS

1. ----------
Dr. Mahiuddin Ahmed
Professor
IPE Department, BUET

Chairman & Supervisor

2. ----------
Dr. Ahsan Akter Hasin
Professor
IPE Department, BUET

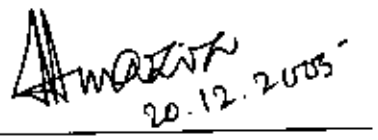
Member

3. ----------
Dr. Abdullahil Azeem
Assistant Professor
IPE Department, BUET

Member

DECLARATION

It is hereby declared that this thesis or any part of it has not been submitted elsewhere for the award of any degree or diploma.



20.12.2005

Mamun Monzurul Aziz

ACKNOWLEDGEMENT

First of all the author wishes to thank the immeasurable grace and profound kindness of the almighty Allah, the supreme authority of the whole universe.

The author wishes to express his sincere gratitude and profound indebt ness to Dr. Mahiuddin Ahmed, Professor, Department of Industrial and Production Engineering (IPE), Bangladesh University of Engineering (BUET), Dhaka for his expert guidance, continuous supervision, proper advice in every step of execution, preparation, completion of the project thesis. I am also grateful to him for giving me his valuable busy time to dictate and guide me about the subject matter time to time when necessary.

The author is indebted to all the employees and engineers of Bangladesh Telegraph and Telephone Board who helped him different time with necessary knowledge and documents regarding BTTB. Specially the author is immensely grateful to Engineer Mrinal Kanti Das, Acting Director General (DG), Telecom Staff College, BTTB; Engineer Suvankar Pandit, DE, Telecom Staff College,BTTB and Engineer Md. Rafiqul Matin, DE, Uttara Exchange,BTTB for their heartiest help with necessary documents for the thesis.

The author is grateful to those people who participate in his survey directly or indirectly for the analysis of the subject matter of the thesis.

Finally, the author offers his sincere thanks to all those who either directly or indirectly helped him in various ways to complete this thesis.

ABSTRACT

Telecommunication is the main backbone of any country. No country can sustain development without a strong telecom infrastructure as present world is the era of information technology.

Few years ago Bangladesh Telegraph and Telephone Board (BTTB) was the only telecom ageney in Bangladesh. So there was immense monopoly power of BTTB. Monopoly in the sense that there is no alternative. As a Government Organization cannot take the opportunity of Monopoly actually as Government organization gave service for the nation only not for a particular governing body or else. It is true that after independence to present time as much as telecom infrastructure have been build up in our country are possible mainly due to the contribution and activities of BTTB. The scenario is changed now days as there are many private operators doing telecom business. Five mobile company are doing there business as the strong competitor of BTTB. More over BTRC has given license to 17 companies for land phone business and some of them has already in the field with there Wire less Local Loop(WLL) system. So still BTTB is the only Government body in telecom field and only Operator of Fixed and Wire connected Phone i.e. PSTN. Mobile phone is not actually a substitution of fixed line. But due to its low capacity, unavailability and poor quality BTTB fixed line service is facing a competitive threat from mobile services. As a result, BTTB is undergoing through a great challenge for its meaningful operation..

There are various criteria for measuring service quality. For a telecom field those criteria can be classified into customer oriented service quality and network oriented service quality. For the assessment of BTTB's service quality a few criteria has been set up and regarding those criteria a survey was made to understand the present state of service quality of BTTB. Along with this different documents helps to identify the service quality standard of BTTB.

This study has measured the service quality of BTTB and suggested some improvements that should be introduced for the existence of BTTB and for its profitable and smooth operation. In this thesis some important and possible improvement has been pointed out for the improving the service quality of BTTB and for its future existence as a top telecom organization of Bangladesh.

CONTENTS

Chapter-4

SERVICES OF BTTB WITH RECENT PERFORMANCES

Chapter-5

ANALYSIS OF SERVICE QUALITY OF BTTB

Chapter-6

RECENT DEVELOPMENT AND PROGRESS OF SERVICE QUALITY OF BTTB

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

1.1 Overview on subject-matter

Service Quality is continuously growing in importance in the telecommunications industry because competition is growing fiercer and technology is developed rapidly day by the day. The Service Quality Standard is needed to establish for ensuring the over all service quality including customer service quality and network performances for any telecommunication business specially for the fixed network telecommunication business in order to integrate national information infrastructure after opening up the telecom market and to protect consumers' rights and interests. This thesis is concentrated on the service quality of a fixed network telecommunication business organization named Bangladesh Telegraph and Telephone Board (BTTB), the only fixed line and government telephone operator of Bangladesh.

The facilities of telecommunications companies shall be designed, constructed, maintained, and operated to ensure reasonable continuity of service, uniformity in the quality of service furnished, and the safety of persons and property. Telecommunications companies shall employ prudent management and engineering practices, including reasonable procedures for forecasting demand for service, to ensure that sufficient facilities and an adequate operating force are available to meet reasonable demands under normal operations. For the improvement of the over all service quality of a telecommunication organization those functions should be maintained highly. But before that a true assessment of the service quality should be needed for the quality standard of the respected organization. This analysis of service quality will indicates the necessary improvements of the telecommunication organization.

Despite the slow development of telecom services in the past, improved commitment, guaranteed funding and beginning of a long term planning by the government shows that the ongoing telecommunications projects will be successful and the overall telephone infrastructure of Bangladesh will grow stronger. At present the telecommunication sector is very competitive

in Bangladesh as there are so many telecom operators in the country. But BTTB is the only government body among them and it is also the only fixed telephone operator. So the analysis of service quality standard of BTTB is very much essential to find out its problems and also to find out necessary steps for its improvement for the welfare of telecommunication sector of Bangladesh.

1.2 Objectives of the study

The objectives of the study of this thesis are

- To study the present status and quality of services of BTTB which comprises both customer services and quality of technology i.e. network performances.
- To analysis the overall service quality of BTTB and make a reasonable evaluation.
- To find out some possible steps necessary to improve the service quality of BTTB.

1.3 Methodology

To meet the objectives, firstly, a theoretical study and physical inspection was carried out and secondly , a survey was carried out on the service quality of BTTB with the basis of different criteria regarding customer service mainly such as customer satisfaction, reliability, simplicity, security, accuracy, flexibility, support and responsiveness and so on. On the other hand the quality network performance i.e. the quality of technology will be studied through the study of on going technologies of BTTB and comparing the existing technology with available modern technology. Both structured and unstructured questions were prepared before the visits and survey. The survey was conducted with more than 100 subscribers and their written opinions were collected. Some documents about the service of BTTB were also collected from some employees of BTTB. Finally, some points founded out through these study, survey and analysis to improve the service quality of Bangladesh Telegraph and Telephone Board (BTTB).

1.4 Necessity of the improvement of Service Quality of BTTB

Telecommunication is both an industry and an infrastructure, which helps other infrastructures to grow. Absence of good telecommunication facilities deters investments in other sectors of the economy. The telephone density in Bangladesh was about 0.79 per 100 people in 2004, far

below the world average of 10 telephones per 100 people. This low density of telephone in Bangladesh is due primarily to inadequate investment in this sector in the past. In order to enhance the investment in the telecommunication sector, the government has been pursuing the policy of raising the public sector allocation on the one hand and attracting private sector investment by privatizing certain services e.g. rural telecommunication, cellular mobile service, paging and radio trunking services etc. on the other.

Before establishing the National Telecommunication act 1998 BTTB had strong monopoly power in the field of fixed telephone (PSTN). So the concept of Service Quality was not so important. But from the past history of operation of BTTB we found that BTTB has improved and changed its Technology and network very gradually and with more or less better quality as much as possible considering the poor infrastructure of the country.

The Bangladesh Telecommunication Regulatory Commission (BTRC) was established on January 31, 2002 under the Government of the People Republic of Bangladesh. By Act no. 18 of 2001, as an Independent Regulatory Commission. The BTRC consists of five appointed Commissioners including Chairman and a Vice-Chairman. After the establishment of BTRC the regulatory power has been ceased from BTTB

On the commencement of the Bangladesh Telecommunication Act, 2001 BTTB became and operator like other private operators and has to be corporatised within few year. Already BTRC has given license to not less than 15 private operators (as shown in Table 1.1) for running PSTN business in the country. So there are so many competitors for BTTB now a day. Customer will accept that operator whose quality of service for both the case of customer service and network performance is better.

Table 1.1

Total Licenses Issued by BTRC up to 30 May, 2005

SL. No	Category	Total
01.	New Public Switched Telephone Network (PSTN) (15 Company)	37
02.	Old PSTN Operator License	3
03.	Cellular Mobile Telecom Operator License	5
04.	Internet Service Provider (ISP)	219
05.	VSAT-User	88
06.	VSAT-Provider	30
07.	VSAT-HUB	4
08.	Domestic Data Communication Service Provider (DDCSP)	24
	Grand Total	410

(Source: http //www.aptsec.org/meetings/2005/PRF05/docs/PRF-05-ID-Bangladesh%20Telecoms%20Reg doc, on date 31/10/05)

[S.N Previously there were 22 operators who had licenses of PSTN business and in 2005 extra 15 companies are given licenses, so in total 37 PSTN operators were given licenses]

Telecom act,1998 says that as a long term strategy, development of telecom infrastructure and services in all the fields are to be opened up for private participation after the year 2010 and if needed , this can be opened up earlier than the year 2010. So there comes a great challenge for BTTB for its existence not only as a leader but also a ordinary operator.

Thus it is very very important to improve the service quality of BTTB as much as possible considering the full benefit of customer. Moreover as government body BTTB has to serve with high service quality for the people of the country and for the development of the country as a whole.

CHAPTER 2

TELECOMMUNICATION & SERVICE QUALITY

2.1 Telecommunication

The definition of telecommunication is changing day by day. Before, telecommunications meant telephone systems. But those days are over. Other things have crept into modern telecommunication. Now, we have to deal with a wide spectrum of communications equipment and technology. In the broadest sense, telecommunication means any system that handles voice, text, data, video or any handling of information in motion using networks built around telephones, coaxial cables, optical fibers and terrestrial radio and satellite links, whenever it is found, in whatever form.

The services offered range from simple voice telephony to highly sophisticated multimedia communications. In basic telephony services, data are carried from one point to another without being processed. Telecommunications also include other services such as mobile communication, data transmission and value added services which combine additional services to data transfer. The public switched telephone network (PSTN) offers a suitable gateway for voice data and low to medium speed data transmission, as well as for access to information services and networks such as the Internet. Telecommunications, broadcasting and computing are converging with more intensification. Moreover the information infrastructure and data compression technology are developing rapidly. Thus the creation of new services in telecommunication sector is very necessary.

Telecommunication is the main backbone of any country. No country can sustain development without a strong telecom infrastructure. One of the first priorities of any government is to be able to communicate smoothly around the country. Communication is not just building roads and bridges and railway but most importantly to set up a strong telecom infrastructure around the country. Communication is one of the basic physical infrastructures for economic

development and plays a vital role in stimulating economic growth and improving the quality of life. Telecommunication reduces the need for traveling and thus save both time and money.

2.2 Telecommunication in Bangladesh

Although the contribution of telecommunication to GDP was quite significant (about 12 per cent in 1994/95), the present facilities, particularly in the area of telecommunication, are quite inadequate in terms of requirement, technology and quality of services. Because of the importance of communication systems in the socio-economic development, high priority should be attached to this sector for Bangladesh. Despite the slow development of telecom services in the past, improved commitment, guaranteed funding and beginning of a long term planning by the government shows that the ongoing telecommunications projects will be successful and the overall telephone infrastructure of Bangladesh will grow stronger.

The Telecommunication sector comprises mainly of Bangladesh Telegraph and Telephone Board (BTTB). Besides the public sector programs, telephone services are in operation in the private sector in a modest scale.

2.3 General Background of Bangladesh Telegraph and Telephone Board (BTTB):

The Telegraph branch of the Posts and Telegraph Department was created in 1853 in the then British India, which was afterwards regulated under the Telegraph Act of 1885. This was reconstructed in 1962 as Pakistan Telegraph and Telephone Department. After the independence of the People's Republic of Bangladesh in 1971, Bangladesh Telegraph and Telephone Department (T & T) was set up under the Ministry of Posts and Telecommunications with a view to run the Telecommunication Services on commercial basis in Bangladesh. This was converted into a corporate body named Bangladesh Telegraph and Telephone Board after promulgation of Bangladesh Telegraph and Telephone Board Ordinance No. XLVII of 1975. In pursuance of Ordinance No. XII of 1979 promulgated by the President of the Peoples Republic of Bangladesh on 24th February 1979, Bangladesh Telegraph and Telephone Board (BTTB) was again converted into a Government Board. In this way the Bangladesh Telegraph & Telephone Board (BTTB) came into existence.

BTTB is still the biggest telephone operator of Bangladesh and it operates basic telephone services- overseas communication and national transmission network. BTTB is also providing some value added services as Dial-Up and Leased Line Internet services, International Private Leased Circuit (IPLC) services, Digital Subscribers Line (DSL), Telex Services and Packet Switch Data Network (PSDN) services Because of the recent development policy adopted by the government, BTTB is no more the sole provider of telecommunication services but it still does have a monopoly on fixed lines. Presently, BTTB has over 9 lakh fixed connections *[1]* but mainly based in the major cities and towns. Bangladesh has a low teledensity of 0.79 phones per 100 people- lowest in this region. This is due to the fact that telephone services are still limited in the villages. Bangladesh's Rural Telecom Authority (BRTA) only had a capacity of 24,000 connections until 2002.

2.4 Introduction of Service Quality

There is no common or formal definition of service quality. Service quality evolves over time and relates to the customer's developed attitude toward a service. The term Service Quality was coined by the marketing research team of Parasuraman, Berry, and Zeithaml *[5]*. They define service quality in terms of reducing the gap between customers' expectations for excellent service and their perceptions of services delivered.

One user may be satisfied, while another is not, with the same service. Service quality aims to describe a global judgment or attitude.

Hernon and Altman point out *[6]* "by inference, satisfaction levels from a number of transactions or encounters that an individual experiences with a particular organization fuse to form an *impression* of service quality for that person. The *collective* experiences of many persons create an organization's reputation for service quality."

The IEEE(Institute of Electrical and Electronic Engineers) paper provides a more general definition of QoS for applications that must communicate in real-time: "The set of those quantitative and qualitative characteristics of a distributed system, which are necessary in order to achieve the required functionality of an application."

2.5 Service Quality Concept for Telecommunication

Quality of Telecommunication Service is the end result of network designing, planning, engineering, operation and maintenance and the management of services delivered by the use of network and human resources to a customer. It depends on technical standards of various network components, traffic ability, serviceability, accessibility, etc, and service management functions.

The ITU-T defines the Quality of Service as:

> *"the collective effort of service performance which determines the degree of satisfaction of user of all the services "*

The degree of consumer satisfaction bears a direct relation with Quality of Service where good Quality of Service gives better customer satisfaction and bad Quality of Service leads to dissatisfaction of the consumers. In a monopoly situation, a customer has no choice but to accept the quality of service of whatever level of standard that the monopoly operator provides. However, by bringing in competition and giving free choice to select an operator, the market share of an operator would largely depend on the quality of service and the price. More discerning customers might even opt to pay a higher price for a better quality of service. Consumer complaints represent the negative perception of Quality of Service.

Quality of Service as perceived by a customer largely depends on:

1. *Service support performance*: It is the ability of an operator to provide service and maintain it, i.e., provisioning of service, billing, etc ;

2. *Service operability performance*: The user - friendliness, simplicity and ease of use of the services ;

3. *Service integrity performance*: transmission performance to the pre-established performance criteria.

4. *Serve ability performance*: accessibility, retain ability, and reliability signifying; making available the services to a customer on request and ability to provide it without

interruption. At the network level it ensures dependability and represents traffic ability, transmission, and satisfactory performance of all the elements of the network.

The service support performance depends upon the maintenance philosophy for telecommunication network and services and the efficient management of maintenance resources.

A customer generally experiences the combined output of the two entities, viz: the network for the technical aspects and the service management in regard to systems, procedures and other human related aspects. Human related aspects are most important to the user even though it is not always recognized by an operator. The human related aspects are concerned with support, while technical aspects are concerned with serve ability and integrity. Operability is technically related but is also a man-machine relationship and may be considered as falling in the realm of human aspects.

Network performance is an important element of quality of service and relates to the technical part of the Quality of Service parameters. It covers, planning, development, operations and maintenance of the network. Quality of Service is a service attribute, is user oriented and is focused on user observable effects at or between the service access points, whereas, the network performance by itself is focused on technical aspects.

2.6 The criteria of the service quality for telecommunication

According to the discussion of 2.5, service quality for Fixed Communication (PSTN) Business can be classified as

- *Quality of Customer Service* , and
- *Quality of Network Performance*

The telecommunications operator shall continuously control the quality and performance of its public communications networks and communications services.

2.6.1 Quality of Customer Service

The service management parameters i.e. the customer service performance are as below

a. **Tangibles Features**
b. **Service provisioning**
c. **Planning**
d. **Subscriber's Satisfaction**
e. **Reliability**
f. **Simplicity**
g. **Support and responsiveness**
h. **Competence**
i. **Courtesy**
j. **Credibility & Honesty**
k. **Security**
l. **Billing**
m. **Profitability**
n. **Understanding the customer**
o. **Reputation**
p. **Value added services**
q. **Availability of new connection etc**

2.6.2 Quality of Network Performance

The Quality criteria for network are mainly based on the following those are applicable to the network.

a. **Speed**
b. **Reliability**
c. **Availability**
d. **Simplicity**
e. **Security**
f. **Fault repair Capability**
g. **Signaling**
h. **Competence**
i. **Flexibility**
j. **Using Modern technology**
k. **Traffic management**
l. **Profitability etc.**

The Quality of Service being the collective result of service and network performance. It is not measurable in absolute terms. However, it is assessed by measuring the variations in the key service performance indicators that contribute to the service quality.

CHAPTER 3

PAST PERFORMANCE AND RGULATORY FRAMEWORK

3.1 Review of Past Performance of BTTB

3.1.1 Financial and physical performance:

From 1973 through 1990, a total of Tk. 7,414.30 million in current prices was allocated to the Bangladesh Telegraph and Telephone Board through Annual Development Programmes (ADPs). The total expenditure against this allocation was Tk. 7,043.60 million which was about 95 per cent.

In 1973/74, there were 60,000 telephones operating in the country (6,000 in rural areas and 54,000 in urban areas).The number of telephones increased to 120,000 lines in 1979/80 (10,600 rural and 109,400 urban) and to 182,000 lines in 1984/85 (26,600 rural and 155,400 urban).The telephone density of the country was 0.13 per 100 population in 1979/80 and it increased to 0.18 in 1984/85. The country entered into satellite communication after installation of a standard "A" Earth station at Betbunia, Chittagong in 1975. This facility for overseas telecommunication was further expanded by setting up a standard "B" Earth Station at Talibabad in 1981.

In the Third Plan (1985-90), BTTB undertook a number of programmes / projects to expand and develop the telecommunication system of the country. The Third Plan target was to install 75,000 telephone lines (65,000 in urban areas and 10,000 lines in rural areas). Against this target, 59,190 telephone lines (53,500 in urban areas and 5,690 in rural areas) were installed during the Third Plan period. As a result, telephone density per 100 population increased from 0.18 in 1984/85 to 0.21 in 1989/90 and the total number of telephones in the country stood at 241,190 in 1989/90. Digital technology in the country's local telephone system was introduced during the Third and Fourth Plans through the installation of 26,000 lines capacity

digital exchanges (comprising six exchanges) and a 5,000 line tandem switching exchange in Dhaka city. The Dhaka-Khulna analogue microwave link was replaced by a digital system during the Third Plan. The expansion of Dhaka Telecommunication Training Centre (TTC) and the construction of the Telecommunication Staff College at Gazipur were completed during the Third Five Year Plan.

3.1.2 Performance During Fourth Plan(1990-95)

Financial performance:

In the Fourth Plan, the total allocation for telecommunication sub-sector provided through ADPs was Tk. 14,228.10 million and the total expenditure was Tk. 13,524.80 million or 95 per cent.

Physical performance:

The Bangladesh T&T Board undertook a number of projects to modernise, expand and develop the telecommunication system of the country during the Fourth Plan. Against a target of 103,058 telephone lines, 72,507 lines were installed (67,801 lines in urban areas including 46,851 digital and 4,706 lines in rural areas). As a result, the telephone density increased to 0.26 per 100 people at the terminal year of the Fourth Plan. However, 89 per cent of the telephones were in the urban areas and only 11 per cent in the rural areas.

During the Fourth Plan, 6 more district headquarters and other important places were covered with 9 auto exchanges and in the process, 3 manual exchanges were replaced by auto ones. The target for Public Call Offices (PCOs) at union level was 118, out of which 57 was installed. In the village growth centres, 84 PCOs were established against a target of 105. To increase accessibility of the telephone facilities to the common people 1,200 card phones were installed.

The Nation Wide Dialling (NWD) facilities were extended to 5 district headquarters and 4 other important places, thus covering all of 64 district headquarters. The overseas circuits were increased and a new Standard "A" Earth Station was set up at Mohakhali, Dhaka.

3.1.3 Performance During 1995-97

Financial performance:

In 1995/96 and 1996/97, an allocation of Tk. 3,450.97 and Tk. 2,137.77 million respectively were provided of which the entire amount was utilised.

Physical performance:

The total number of telephone lines were 463,185 in the public sector and 21,000 in the private sector upto June, 1997. The private sector is mainly confined to different thanas and villages. Besides, the number of cellular phones rose to 39,000 in 1996/97 over 2,000 in 1994/95.

In 1995-97, 95,000 digital lines were installed in Dhaka. In the same year 41,250 new digital telephone lines were installed in Chittagong. Internet connections were lined up in 1995/96 under private initiative with the support of BTTB.

3.1.4 Private Sector Participation

During the Fourth Plan period, the newly licensed private sector operators started their services. Bangladesh Rural Telecom Authority (BRTA) was given licence for establishment of telecommunication services at 199 Thanas. BRTA installed 27 exchanges at thana / rural growth centres. Pacific Bangladesh Telecom Ltd. started providing cellular mobile telephone service in the country. Bangladesh Telecom Pvt. Ltd. started the Paging and Radio Trunking services. Licence for establishing telecommunication services in 191 thanas was given to another rural operator Sheba Telecom Ltd. in early 1995.

In November, 1996, licences for cellular mobile telephone were issued to Grameen Phone, Telecom Malaysia International BD Ltd. and Sheba Telecom Ltd. This will increase competition in the sector and lower the cost of cellular mobile phone considerably. The new licencees have already started providing services. All these are joint-venture companies between Bangladeshi companies and foreign partners. Thus, in the private sector, there are 7 operators for different services. In addition, six private companies, namely, Integrated Services Network, Grameen Cybernet, BRAC, Prodesta and Spectranet have started providing Internet and Electronic Mail services in the country.

3.1.5 Constraints/Bottlenecks During Past Plans

Delay in land acquisition in many cases caused delay in project implementation. The tendering process, specially in case of the international tender for "Greater Dhaka Telecommunication Network Improvement (Phase-II)" took a long time in finalisation causing abnormal delay in implementation of the project. Also for want of a suitable collaborator, the project for "Modernisation of TSS with appropriate Technology Transfer for Manufacturing and Installation of 100,000 line Digital Switching Equipment per annum" could not make any headway.

As the experience over various plan periods has it, poor management, faulty preparation of the project documents, inadequate transfer of technology, too much dependence on the expatriate consultants, delay in recruiting the project personnel, frequent changes of project directors, lack of MIS and inadequate maintenance services and inability of BTTB to raise funds from the market, stood on the way of timely implementation of projects for development of the telecommunication of the country.

3.1.6 Fifth Five Year Plan (1997-2002)

One of the main objectives of the Fifth Plan was to alleviate poverty through accelerated economic growth and the creation of gainful employment. The average annual growth rate of GDP during the Plan period is projected at 7 per cent. One of the prerequisites for accelerated economic growth of Bangladesh in a competitive environment is the availability of adequate telecommunication services for quick acquisition and dissemination of information, both inside and outside the country.

Objectives:

The major objectives of the Fifth Plan for the telecommunication was to :

a. ensure universal telephone services;

b. expand the telecommunication infrastructures in both the urban and rural areas so as to enable the providers to give one telephone per 100 people by 2002 against the existing 0.39 telephone per 100 people;

c. expand the international telecommunication circuits and ancillary facilities for smooth international telecommunication operations both in urban and rural areas;

d. ensure telephone connection to all industries, particularly those located in Export Processing Zones(EPZs) and industrial estates;

e. improve the quality of service;

f. develop necessary telecommunication network to facilitate export of software, data entry/data processing services and support the growth of informatics;

g. encourage competition between public and private sectors to provide best services at customer's choice;

h. attract foreign direct investment (FDI);

i. increase the role of the private sector in telecommunication ; and

j. strengthen the Telecommunication Regulatory Board for the formulation of appropriate legal and institutional frames to introduce and sustain fair competition among the operators and to protect consumer's interest.

3.2 Regulatory Framework & Telecommunications Law for BTTB

The Ministry of Posts & Telecommunications (MOPT) holds the responsibility of sector regulation. The Telegraph Act of 1985 is the primary law governing the sector and granted the government exclusive power to establish and provide all telecommunications services and products. The Wireless Telegraphy Act of 1933 governs the operation of one way Radio Communications, Paging and Radio services. The BTTB Ordinance of 1979 provided BTTB the monopoly rights and powers for issuing license for telecommunications and wireless services. In October, 1995 Government of Bangladesh (GOB) amended the BTTB Ordinance, 1979 and transferred the regulatory authority from BTTB to MOPT. The Bangladesh Telecommunication Regulatory Commission (BTRC) was established on January 31, 2002 under the Government of the People Republic of Bangladesh. By Act no. 18 of 2001, as an Independent Regulatory Commission Presently BTRC is the principal telecommunications policy maker. Other institutions, such as Ministry of Finance and the Planning Commission are also involved in policy making process.

To build up infrastructure and formulate rules & regulation to operate BTTB were strongly dependent on the acts and ordinance established at different times. Thus the development of BTTB and its control has been changed, improved and progressed at different times through different act. The overall quality of service and technology of BTTB thus also varied time to time. So it is necessary to have brief idea about those acts.

The basic statutory framework relating to telecommunication in Bangladesh consists of:

- The Telegraph Act of 1885
- The Wireless Telegraphy Act of 1933
- The Bangladesh Telegraph and Telephone Board Ordinance of 1979.
- The Bangladesh Telecommunication Act, 2001

3.2.1 The Telegraph Act of 1885

The Telegraph Act of 1885 is the primary statute governing Telecommunications in Bangladesh. This Act granted to the Government exclusive powers to establish and maintain all types of telecommunications transmission services and products. The Telegraph Act established other broad privileges and powers of the Government with respect to

telecommunications, including right to grant or revoke licences to private parties; seize licensed facilities and intercept messages in the event of public emergencies; issues rules governing the operations of government or private licensed facilities; and exercise power of compulsory acquisition over public and private property. The Telegraph Act also laid down specific penalties for variety of offences, including the illegal operations of facilities; unlawful intereception of messages; interference or damage to facilities; theft of transmission lines; annoyance or intimidation through the use of telecommunication facilities; bribery and other misconduct by telegraph officers; and transmission of fraudulent or obscene messages.

3.2.2 The Wireless Telegraph Act of 1933

The wireless Telegraph Act of 1933 applied primarily to one-way or broadcast services, specifically radio and television (other one-way telecommunication services, such as paging, are authorized under the Telegraph Act). Under Section 3 of the Act, possession of wireless apparatus is prohibited, except under the terms of a licence. The Wireless Telegraph Act governs the granting of licences to manufacturers and retailers involved in sale of radio equipment, as well as the licensing of radio and television receivers. Magisterial powers are granted to certain officials to summon. Finally, the Government is authorized to issue regulations to implement the provisions of the Act.

3.2.3 The Bangladesh Telegraph and Telephone Board Ordinance, 1979.

By virtue of the 1979 Ordinance, both the monopoly rights and the power to issue licences, for both telecommunications and wireless services, were transferred to the BTTB. Section 8 sets out the functions of the Board in very wide terms, including exercise of all powers of the Government under the Telegraph Act 1885, except to make rules under the Act and to determine certain disputes with a Local Authority. The powers of the BTTB in practice severely circumscribed by the need to obtain Government approval under Section 8(i) and the First Schedule of the Ordinance for its capital and revenue budget, and for many changes in the employment conditions of its workers..

3.2.4 National Telecom Policy (NTP), 1998

The Strategic Vision of the Telecom Policy is to facilitate Universal Telephone Service throughout Bangladesh and where there is a demand, all those Value Added Services such as

Cellular Mobile Telephone, Paging, Data Services, Access to Internet (including electronic mail), Voice Mail, and Video Conferencing – all at an affordable cost without compromising performance.

To achieve the Vision, Government's role as a service provider will diminish as the private sector's role increases. The Government's objective will be to create a new policy environment to support this new scenario. Its ability to create policy, regulate and facilitate will be strengthened through a new Telecommunications Act which reflects the Government's new policies, objectives and strategies and establishment of new institutions including a Telecommunication Regulatory Commission (TRC) which will become the guardian of the Act and fulfill its regulatory functions.

The Regulatory Commission to be headed by a Chairman, will be formed through a parliamentary act. The Commission's main function will be to issue license to private operators, control tariff, regulate technical standard, prepare national numbering scheme, represent international telecommunication organizations and encourage investment in the sector. The Commission will have an autonomous body and its chairman and other members will be appointed for a certain period.

According to National Telecom policy,1998, the broad Bangladesh Telecommunication Policy objectives are:

- to encourage orderly development of telecommunications system that serves to augment and strengthen the social and economic welfare of Bangladesh;
- to ensure access to and delivery of a full range of reliable, reasonably priced, up to date telecommunications services to as many people as is economically and socially justifiable, both in urban and rural areas, throughout Bangladesh,
- to enhance the efficiency and competitiveness. at the national and international level of Bangladesh Telecommunications;
- to rely increasingly on competition and a market oriented regime in the provision of telecommunication services and to ensure that regulation, where required, is efficient and effective,

- to stimulate research and development in Bangladesh in the field of telecommunications and to encourage innovation in provision of telecommunication services;
- to protect the interest and respond to the needs, both social and economic, of users of telecommunication services,
- to maintain and promote competition among service providers;
- to encourage introduction of new services and to encourage major users outside Bangladesh to establish places of business in Bangladesh.

The Government of Bangladesh has plan to increase the number of telephone lines to 1300000 in the country from about 500000 now(in the year 1998) with in the next two years.

This will raise the ratio of telephone lines to 1:100 from the existing 0.40:100 people.(in the year 1998)

The policy has emphasized improvement of telecommunications system in the private sector and creation of a competitive environment for expansion and improvement of the services. Foreign investment in the sector will also be encouraged. The private operators will play a strong role in the sector in future and the Government will provide all necessary cooperation. Replacement of the analog system with digital system will be made within the year 2005 to improve the services and create confidence among the people.

The ratio of telephone lines will have to be increased to 4:100 people within the year 2010, it said. Under the long term plan private sector operations will be allowed in all areas of infrastructure development after the year 2010.

The fact that BTTB is a departmental enterprise, combined with its position as an enterprise through which important Government objectives are met, it is unlikely that BTTB can achieve greater autonomy under its current legal and regulatory status.

3.2.5 The Bangladesh Telecommunication Act, 2001.

The Bangladesh Telecommunication Act 2001 is the latest legislation under which the BTRC is established with the vesting of certain powers and regulatory functions in Telecom Sector. This

Act of 2001 has superseding and overriding effect over all other laws to the extent they are inconsistent therewith.

The Bangladesh Telecommunications Act 2001 after its enactment by the Parliament and assented to by the President was published in the Bangladesh Gazette on 16th April 2001 and was subsequently by a Gazette notification put into effect on 31st January 2002.

The Act aims at establishing the BTRC as an independent commission the legislative intent of which has been manifested in its preamble.

The Bangladesh Telecommunication Act 2001 provides for establishment of the BTRC, it's powers and functions, offences and punishment there under etc.

CHAPTER 4

SERVICES OF BTTB WITH RECENT PERFORMANCES

Table 4.1 shows the performances of the overall services of BTTB for the year 2003-2004.

Table 4.1: PERFORMANCE AT A GLANCE

SERVICE CATEGORY	2002-2003	2003-2004
TELEPHONE SERVICES		
No. Telephone Exchanges	652	638
Exchange Capacity	920993	966349
Telephone Connections	716721	810158
Public Call office	695	695
Card Phones	1515	1507
TELEGRAPH AND TELEX SERVICES		
Inland Telegraph Office	848	848
International Telegraph Office	01	01
Inland Telegram(Messages)	282042	268438
International Telegram(Messages)	36516	25377
Telex Exchange Capacity	2000	2000
Connections (Telex)	1230	925
GENTEX Services(Office)	135	135
INTERNET SERVICES		
Internet Capacity (backbone)	(6+4) MBPS	(14+8)MBPS
Internet Connection	10500	15200
OVERSEAS CIRCUITS		
Telephone	3700	4171
VPT	09	09
DATA	52	226
Incremental	-	1920
Leased Circuit	05	05
NATIONAL AUTO TRUNK		
NWD Circuits Capacity	54943	64812
NWD Circuits Working	33781	42049

(Source: Annual Report 2003-2004, BTTB, Page5)

With all of its established infrastructures and Human resources at this moment BTTB is providing basic telecommunication services through out the country and also providing carriers to communicate with the outside world. BTTB is also providing some value added services as Dial-Up and Leased Line Internet services, International Private Leased Circuit (IPLC) services, Digital Subscribers Line (DSL), Telex Services and Packet Switch Data Network (PSDN) services.

The ongoing services those are being offered by BTTB will be discussed briefly in the following ---

4.1 BASIC TELEPHONY

At the end of 2003-2004 fiscal year Bangladesh T & T Board had 638 Telephone Exchanges with a total capacity of 966,349 lines. BTTB started operating digital local exchanges after installation of six NEC-NEAX 61E exchanges in the Dhaka Telecom Region Network in 1990-91 fiscal year with initial total capacity of 26,000 lines. Upto 2003-2004 financial year Seventy eight(78), Forty eight(48), Seventy nine(79), Twenty five(25), twenty five(25) and Sixteen(16) local digital exchanges were installed in Dhaka (South/North/East), Chittagong, Khulna, Rajshahi, Rangpurand Sylhet Telecom Regions respectively. These were supplied and installed by NEC(Japan), Alcatel(France), Italtel(Italy), Ericsson(Sweden & Mexico), Netus(Turkey), GDt(Chaina) and ZTE(Chaina).

Exchange status of BTTB as on June 2003 and June, 2004 are given in the following Table 4.2 and Table 4.3 respectively

Table 4.2
BTTB telephone Exchange Status as on 30 June,2003

Region	Type	Number	Capacity (No. of Lines)	Connection (No. of Lines)	Pending demand (No. of Lines)
Dhaka(S)	Magneto	06	534	387	3897
	C.B	02	200	166	101
	Auto(analog)	04	1800	1409	519
	Auto (digital)	15	164953	138659	20108
	SUB TOTAL	27	167487	140717	24625
Dhaka(N)	Magneto	37	2649	1908	1057
	C.B	05	790	736	736
	Auto(analog)	02	400	279	112
	Auto (digital)	37	244407	191203	48921
	SUB TOTAL	81	248246	194429	51116
Dhaka(E)	Magneto	04	344	312	599
	C.B	00	00	00	00
	Auto(analog)	00	00	00	00
	Auto (digital)	24	95500	87506	34336
	SUB TOTAL	28	95844	87818	34935
Chittagong	Magneto	73	4167	3130	4148
	C.B	28	4711	3941	4214
	Auto(analog)	18	5120	3754	2086
	Auto (digital)	27	125264	101115	33753
	SUB TOTAL	146	139262	111940	44201
Khulna	Magneto	53	3418	3385	1107
	C.B	30	5305	4390	1525
	Auto(analog)	19	6800	4820	1614
	Auto (digital)	73	114605	73427	10486
	SUB TOTAL	175	130128	85022	14432
Rajshahi	Magneto	22	1652	1051	924
	CB	13	1875	1390	1236
	Auto(analog)	02	800	468	621
	Auto (digital)	25	44908	28373	5396
	SUB TOTAL	62	48935	31282	8177
Rangpur	Magneto	35	1855	1532	387
	CB	19	2540	2051	901
	Auto(analog)	06	2900	2051	753
	Auto (digital)	25	41575	30214	5288
	SUB TOTAL	85	48870	35484	7329
Sylhet	Magneto	22	1830	1298	1495
	C.B	09	1690	1129	1400
	Auto(analog)	02	1000	859	1187
	Auto (digital)	15	37701	26470	12955
	SUB TOTAL	48	42221	29765	17037
Country Total	Magneto	252	16149	12242	13904
	C.B	107	17111	13803	10113
	Auto(analog)	53	18830	13640	6592
	Auto (digital)	240	868931	677036	171243
GRAND TOTAL		652	920993	716751	201852

(Source: Annual report 2003-2004, BTTB, Page 7-8)

Table 4.3
BTTB telephone Exchange Status as on 30 June,2004

Region	Type	Number	Capacity (No. of Lines)	Connection (No. of Lines)	Pending demand (No. of Lines)
Dhaka(S)	Magneto	06	534	387	3496
	C.B	02	200	166	225
	Auto(analog)	04	1800	1374	517
	Auto (digital)	15	168503	155748	16298
	SUB TOTAL	27	171037	157675	20536
Dhaka(N)	Magneto	35	2307	1908	1057
	C.B	05	610	587	645
	Auto(analog)	02	400	272	65
	Auto (digital)	39	256405	227603	29253
	SUB TOTAL	81	299722	230370	31020
Dhaka(E)	Magneto	04	344	321	709
	C B	00	00	00	00
	Auto(analog)	00	00	00	00
	Auto (digital)	24	116500	101676	34395
	SUB TOTAL	28	116855	101997	35104
Chittagong	Magneto	55	4143	3147	3739
	C.B	18	3983	2688	2331
	Auto(analog)	13	3800	2637	1706
	Auto (digital)	48	130463	116337	45654
	SUB TOTAL	134	142389	124829	53430
Khulna	Magneto	50	2978	1975	612
	C.B	29	4940	3873	1398
	Auto(analog)	14	5800	3577	1108
	Auto (digital)	79	116416	82349	5898
	SUB TOTAL	172	130136	91774	9016
Rajshahi	Magneto	21	1283	926	881
	CB	14	1975	1380	1244
	Auto(analog)	02	800	392	618
	Auto (digital)	25	46005	31368	4232
	SUB TOTAL	62	50063	34066	6975
Rangpur	Magneto	35	1790	1370	472
	CB	19	2296	1810	557
	Auto(analog)	06	4100	2349	763
	Auto (digital)	25	41576	31112	1378
	SUB TOTAL	85	49762	36641	3170
Sylhet	Magneto	22	1880	1276	1710
	C.B	09	1690	1134	1562
	Auto(analog)	02	1000	874	1278
	Auto (digital)	16	41826	29522	8464
	SUB TOTAL	49	46826	32806	13014
Country Total	Magneto	228	46396	11310	13904
	C.B	96	15259	11638	10113
	Auto(analog)	43	17700	11495	6592
	Auto (digital)	271	917696	775715	171243
GRAND TOTAL		638	966349	810158	172232

(Source: Annual report 2003-2004, BTTB, Page 8)

4.2 PUBLIC TELEPHONE SERVICES

Several years back public telephone services used to be provided through coin boxes in the urban areas and land line/ wireless Public Call Offices (PCOs) in the rural areas . Service quality of these public telephones had been far from satisfactory according to the annual report of BTTB *[Ref. 1]*. To improve the public telephone service, Card Phone systems were introduced in 1992 with programs of replacing the old coin boxes and P.C.O's. By June 2004, about 1,507 card phone booths were installed in different parts of the country. All card phones have access to nation wide dialing while 271 of them have international direct dialing facility. Due to better and easy public accessibility to telephone this cardphone service has become popular in the country. A massive program of installing card phones has been taken to cover all thanas and rural growth centres of the country.

4.3 TELEGRAPH SERVICES

Telegraph system, the oldest means of telecommunication service, is loosing importance gradually due to introduction of more modern telecommunication systems. In the fiscal year 2003-2004, the total number of domestic telegram message was 268,438 and that of international telegram was 25,377 while in the fiscal year 2002-2003 total number of domestic telegram message was 282,042 and that of international telegram was 36,516, In The fiscal year 2003-2004 number of Telegraph offices was 849.

4.4 TELEX SERVICE

The first digital Telex exchange in Bangladesh was established in May 1981. At the end of fiscal year 2003-2004 the total line capacity of telex exchange was 2000 and the number of subscribers was 925 while at the end of the fiscal year 2002-2003 the total line capacity of the telex exchange was 2,000 and the number of subscribers was 1,230. Introduction of FAX and modern systems has rendered the growth of telex service declining.

4.5 GENTEX NAD BUREAU FAX SERVICE

GENTEX service was introduced in 1989 and later on Bureau fax service was introduced. The number offices providing GENTEX services are 135.Through this service the telegraph offices are interlinked.

4.6 NATIONWIDE DIALING (NWD) SERVICES

In 1983 Bangladesh T & T Board installed the National Automatic Long Distance Telephone Dialing System employing NEAX-61e version of NEC exchange to link all major cities of the country. Beforehand there were Subscriber Trunk Dialing (STD) services based on Analog toll switching system to link few cities of the country with Dhaka. By June 2004, 237 stations including all 64-district headquarters and 173 Upazillas/Growth Centres were brought under this system.Total 42,049 NWD circuits were working by June 2004.

4.7 OPERATORS TRUNK DIALING (OTD) SERVICE

This service has been introduced recently all the upazillas to get access to the upazillas by direct dialing up to the OTD numbers connected in upazillas where there is no automatic telephone exchange. In this system one or two telephone numbers of district automatic telephone exchange are extended upto upazilla level through UHF radio links. The telephone operator of the manual telephone exchange can, through these numbers, connect subscribers of the upazilla with any subscribers of the upazilla of other auto exchanges of the country by dialing respective NWD codes.

4.8 TRANSMISSION SYSTEM OF BANGLADESH

Bangladesh is a riverine country and the country's long route transmission systems are mainly composed of microwave, UHF and VHF radio links. The use of optical Fiber is presently limited within some city areas for interconnecting local exchange and Remote Switching Units (RSU) in Multi Exchange Network. All these transmission systems are operated by BTTB. All Thana headquarters (the smallest administrative units) are connected with their respective districts through UHF links. Most of such UHF links are now digital radio system. Some of the

district headquarters are connected through digital UHF links. Major Microwave radio link of BTTB is listed in Table4.4 and illustrated in figure 4.1.

Table 4.4

Major Backbone Microwave Links as on 30 June, 2004.

LINK	TYPE	Radio Channel Capacity	MADE BY
Dhaka-Narayanganj-Hajigonj-Begumgonj-Chittagong	Analog	1800	NEC
Dhaka-Manikgonj-Faridpur-Magura-Jhinaidah-Kushtia	Digital	140 Mbps	Fujitsu
Dhaka-Manikgonj-Faridpur-Magura-Jhinaidah-Kushtia-Jessore-Khulna	Digital	STM-1	Nortel
Dhaka-B.Baria-Moulavibazar-Sylhet	PDH	140 Mbps	Alcatel
Dhak-Tangail-Mymenshingh	PDH	140 Mbps	Alcatel
Bhola-Barishal	SDH RD STM-1	155 Mbps	Harris
Barisal-Jhalakhati	SDH RD STM-1	155 Mbps	Harris
Barisal-Potuakhali-Khepupara	SDH RD STM-1	155 Mbps	Harris
Khulna-Monglaport	PDH	8 Mbps	Harris
Khulna-Barisal	Digital	34 Mbps	JRC
Khulna-Gopalganj	SDH RD STM-1	155 Mbps	Harris
Rajbari-faridpur-Sadarpur-madaripur-Shariatpur	Digital	STM-1	Harris
Bogra-Joypurhat-Phulbari-Dinajpur-Thakurgaon	Analog	960	Fujitsu
Rajshahi-Natore-Chuadanga	Analog	960	Fujitsu
Bogra-Phulbari-Rangpur	Analog	960	Fujitsu
Bogra-Naogaon-Natore-Rajshahi	Digital	STM-1	Nortel
Chittagong-Satkania-Chiringha-Cox'sBazar	Digital	155 Mbps	Harris
Chittagong-Betbunia	Digital	140 Mbps	Alcatel
Chittagong-Cox'sBazar	Digital	34 Mbps	JRC
Chittagong-Satkania-Chiringha-Cox'sBazar	Analog	960	GDT
Satkania-Bandarban	Digital	155 Mbps	Harris
Betbunia-Subcharri-Rangamati	Analog	300	ZDT
Comilla-Hajigonj-Chandpur	Digital	34 Mbps	Alcatel

(Source. Annual report 2003-2004, BTTB, Page 11)

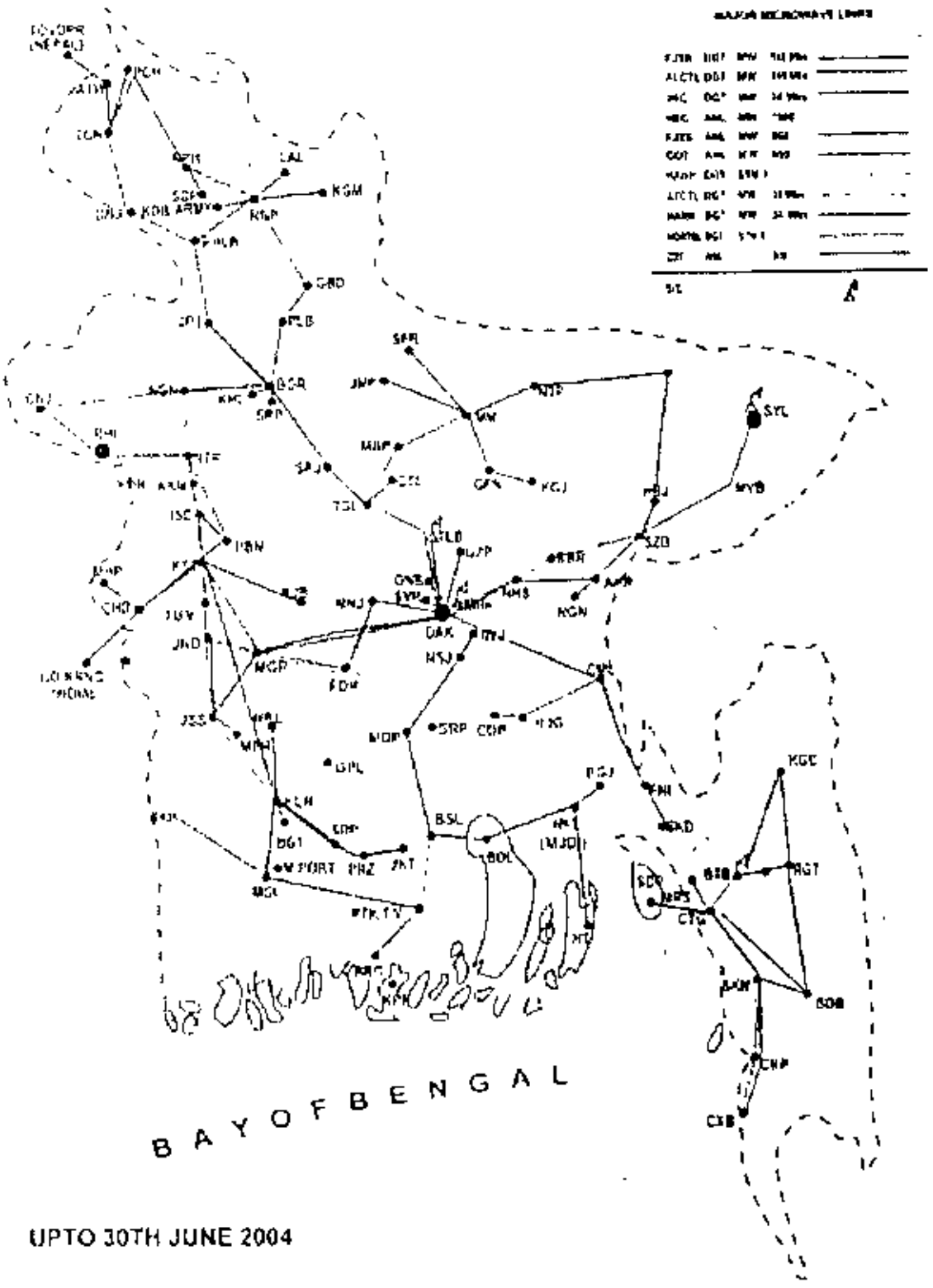


Figure 4.1
Microwave link of Bangladesh
(Source: Annual report 2003-2004, BTTB, Page 12)

4.9 OPTICAL FIBER LINK

High capacity Optical Fiber System with super link is in operation in the country from the year 1998. Optical fiber Networks between Dhaka-Chittagong, Dhaka-Mymensingh, Dhaka-Brahmanbaria, Lakshipur-Maizdi-Choumohani-Feni, Kushtia-Meherpur-Chuadanga & Bogra-Panchagarh (Along with superlink Rangpur-Nilphamari, Rangpur–Kurigram, Rangpur-Lalmonirhat, Netrokona-mymensingh-Sherpur, Pabna-Sirajgonj, Rngamati-Betbunia, Khulna-Satkhira) have been completed by June 2004. The installation work of Optical fiber Networks between Dhaka-Bogra & Brahmanbaria-Sylhet are in progress. After completion of this networks by the end of 2005, BTTB will have a complete backbone optical fiber network from Chittagong to Panchagarh & Dhaka to Sylhet.

4.10 OVERSEAS COMMUNICATION SERVICES

There are four satellite earth stations with three international GateWay Exchanges through which international telecommunication service is provided in Bangladesh..

2.10.1 SATELLITE COMMUNICATION FACILITIES IN BANGLADESH

A single telecommunication satellite in geo-stationary orbit 36,000 Km above the earth can provide telecom services to one-third of the entire world. Advanced digital transmission technologies and more sophisticated use of radio wave in recent years have facilitated large volume of satellite transmission around the globe. To facilitate transmission of incoming and outgoing overseas calls through satellite BTTB has established 4 Earth Stations till to date.

The first earth station was installed at Betbunia near Chittagong in 1975. At present 896(voice887+VFT 3+Data6) international circuits with 11 countries are working through this earth station .

The second earth station was installed in 1982 at Talibabad. At present 361(voice358+VFT 3) international circuits with 2 countries are working through this earth station.

The third earth station which consists of largest International circuit facilities was installed in 1994 at Mohakhali in Dhaka. Now 2, 929(Voice 2,706+VFT 4+Data 219) international circuits with 17 countries are working through this station.

The fourth earth station has been established at Sylhet in 1995 by British Telecom assistance to facilitate only BT-Sylhet traffic. 120 International circuits are working through this earth station .

These earth stations working with different INTELSAT satellites located in the Indian Ocean Region.

Table 4.5

Description of Satellite Earth Stations

Earth Station	Standard	Position	Carrier	Voice	VFT	Data	Total
Betbunia	A	60° E	IDR	887	3	6	896
Talibabad	B	60° E	IDR	358	3	0	361
Mohakhali	A	66° E	IDR	2706	4	219	2929
Sylhet	F3	63° E	IDR	120	0	0	120

(Source: http://www.bttb.net.bd date30/11/05 and annual report 2003-2004, BTTB, page 15)

4.10.2 OVERSEAS COMMUNICATION THROUGH MICROWAVE

There are two microwave links, one is Dhaka- Calcutta the other is Dhaka-Nepal, for overseas communication. Dhaka-Calcutta link has 59 voice circuits and one VFT channel. On the other hand Dhaka - Nepal Microwave link has 12 voice channels.

3.10.3INTERNATIONAL SWITCHING CENTRE

International switching centre(ISC) are mainly responsible for immediate selecting and connecting the appropriate circuit for incoming calls and sending the necessary information to the receiving country's switch to complete the calls. At present BTTB has three international switching centres (ISC) of which two are located at Moghbazar and one at Mohakhali in Dhaka City. ISCs of Moghbazar are of type NEAX-61K and NEAX –61E and ISC of Mohakhali is NEAX – 61 E type. These switching centres are also called ITX(International Trunk Exchange).

4.10.4 INTERNATIONAL OPERATOR ASSISTED CALLS

Person to Person Call

An operator assisted calls for placing call to a specific person; Charges do not begin acquiring until the desired party is reached and the caller is not billed if the party does not answer. BTTB's standard rate applies for the first three minutes and additional two minutes charges for P.P facilities.

Telephone to Telephone call

An operator assisted call for placing call to an specific telephone number is also available. The minimum charge for this call is three minutes.

4.11 INTERNATIONAL MARITIME SATELLITE COMMUNICATION

INTELSAT Satellite links fixed Earth Stations for overseas communication while INMARSAT (International Maritime Satellite Communication) provide mobile communication services for ships and aircrafts. This service make it possible to get in touch with virtually any location around the world 24 hours a day with high quality communications ranging from telephone & telex to facsimile and data communication. Recent development of portable terminal has made it possible for customers to take advantage of INMARSAT service from remote locations also. Till to date BTTB has five INMARSAT-A Terminals operating through LES (Land Earth Station) located in Jeddah.

4.12 DATA COMMUNICATION SERVICE

4.12.1 INTERNET SERVICES

BTTB is now providing Internet access services. The services include dial up access service, leased access services for enterprises, access for local ISPs, mail, Web hosting and .bd name registration and DNS services. Subscribers in all 64 district head quarters and upazillas having Digital Telephone facility is now under internet coverage. It has backbone connectivity of 2+2 Mbps with teleglobe, Canada and another 4+2 Mbps with C&W,UK. Recently another 8+4 Mbps backbone with Intelsat came into operation.

4.12.2 PACKET SWITCH DATA NETWORK (PSDN)

Bangladesh T & T Board has installed an X.25 Packet Switched Data Network at Dhaka & 5 other cities namely Chittagong, Rajshahi, Bogra, Khulna, and Sylhet. This network caters services for three types of subscribers. These are X.25 leased line, X.28 leased and X.28 dial up subscriber.

Inter-city connectivity has been provided through Microwave (existing analog and digital) and international gateway connectivity has been obtained through Mohakhali Satellite Earth Station taking one 64 kbps circuit with VSNL (Videsh Sanchar Nigam Limited), New Delhi. At present the number of subscribers for different type of services are as in Table-VIII.

Table 4.6

List of PSDN Subscribers

Sl. No.	Type of Subscribers	Number of Subscribers
1.	X.25 Leased Line	50
2.	X.28 Leased Line	30
3.	X.28 Dial Up	20

(Source: BTTB web site—http://www.bttb.net, date 30/11/05)

4.12.4 DIGITAL SUBSCRIBER LINE (DSL) SERVICES

Very recently BTTB has installed DSL nodes at 5 exchanges in Dhaka and 4 other places namely Chittagong, Sylhet, Khulna and Bogra. Through this network BTTB is providing high speed point to point data line (64 Kbps to 2048 Kbps) using voice grade copper cables. Already some of the Banks and Corporate Offices have taken this line. The performance of this network is very much satisfactory.

4.12.5 INTERNATIONAL PRIVATE LEASED CIRCUIT (IPLC)

BTTB is also providing high-speed international point to point data circuit for corporate networking through out the world.

4.13 INTERNATIONAL VSAT SERVICES

Very Small Aperture Terminal (VSAT) – A small earth station having dish antenna of typically 0.6 to 2.4 meters in diameter is designed to handle voice, data and private line video communication. Terminal is located at each end and communication is established through geostationary satellite (in this region ASIASAT). As a satellite based solution, VSATs are small and easy to install. A VSAT network can be expanded or modified as the users business needs change and grow. Banks, insurance companies, news bureaus, educational institutions all those and more can be linked across continent. VSAT is allowed to communicate only in corporate data communication and cannot be terminated to any public switched telephone network.

To facilitate high-speed point to point data communication facility throughout the world for the subscriber. BTTB took necessary steps in 1996 to install VSAT in Bangladesh. BTTB made an agreement with Pak Datacom to install and operate VSAT in Bangladesh on 5 year BOT (Build, Operate & Transfer) basis. Under this arrangement Pak Datacom will supply, install, operate and maintain VSAT in Bangladesh on behalf of BTTB. By June 1997, five subscribers were given VSAT data based circuits. Subscribers are charged a fixed monthly rent for each VSAT circuit.

CHAPTER 5

ANALYSIS OF SERVICE QUALITY OF BTTB

5.1 Survey Methodology

A survey has been conducted on the various parameter or criteria of service quality. For this survey a questioner has been prepared on the basis of the service quality criteria those have been mentioned in chapter 2. There were in total 32 questions in that questioner and of them 30 questions were multiple choice types and other two were for written opinions of subscribers on service quality and improvements of service quality of BTTB. The questioner was delivered to around 160 subscribers of different occupations. Sixty (60) questioners were distributed via e-mail and another 100 questioners were distributed directly in printed form. One hundred and Ten (110) subscribers gave their opinions towards different criteria of service quality. Twenty two (22) subscribers gave opinions via e-mail and rest of the subscribers gave opinions in written. The subscribers were chosen randomly. So the there were variation of opinions strongly. Subscribers' opinions towards service quality of BTTB will be mentioned criterion wise in this chapter gradually in percentage.

The survey questioner is attached in **Appendix A.**

5.2 Customer Service Quality

5.2.1 Tangible Features

Tangibles comprise of physical facilities, equipment, personnel, and communication materials of BTTB. These tangibles things are considered as criteria for service quality because a customer can be ensured to have prompt and efficient service from BTTB with the proper and sufficient availability of those features.

Table 4.1 shows the different physical facilities that that BTTB have. Though telephone capacity is poor, the total no of exchanges are not much less in comparison with total

connection. According to Table 4.1 during fiscal year 2003-2004 BTTB had 638 exchanges with total capacity of 966349 telephone lines. The average lines per exchange = (966349/638) =1514.65, which is not much more for a exchange to maintain properly.

Bangladesh T & T Board (BTTB) is run as a Government establishment under the Ministry of Posts and Telecommunications (MOPT). The Board comprises of 1 (one) Chairman, 4 (four) full time Members and 3 (three) part time Members, all appointed by the Government of Bangladesh. As per annual report 2003-2004 the total revenue posts of BTTB are shown in Table 5.1.

Table 5.1: Total Revenue Post of BTTB

Three are 19,409 different categories of revenue posts (working position) in BTTB which are classified into following four(4) classes

Class I Service	:	740 Posts
Class II Service	:	549 Posts
Class III Service	:	14380 Posts
Class IV Service	:	3740 Posts
Total	:	19409 Posts

(Source: annual report2003-2004, BTTB, Page26)

There is no written and accurate data for the posts which are filled out at present because many employees are working outside BTTB in deputation or lien. But according to the rough estimate, mentioned by the engineers of BTTB interviewed by author, around 200 posts are unfilled in class I service.

Table 5.2: Survey Result on Personnel

Proposition (Question-7)	Opinions	Subscribers opinion in Percentage
BTTB has sufficient well and capable technicians and engineers	Yes	30 %
	No	48 %
	Don't know	22 %

5.2.2 Service provisioning

The overall infrastructure and capacity show the service provisioned by an organization. In case of BTTB the infrastructure is very much systematic in a word but in true sense the capacity is very low in respect of the population of Bangladesh. , BTTB has over 9 lakh fixed connections

[1] but mainly based in the major cities and towns. Bangladesh has a low tele density of 0.79 phones per 100 people. According to the BTTB Annual Report 2003-2004, total exchange capacity is 966449 telephone and no of exchange is 668.

Table 5.3: Survey Result on Telephone Capacity

Proposition (Q-26)	Opinions	Subscribers opinion in Percentage
The capacity of telephone lines of BTTB is	Very Poor	14 %
	Poor	77 %
	Sufficient	9 %

5.2.3 Planning

BTTB has a full phase planning division which is called Planning and Development (P&D) Department The organogram of this department is as below

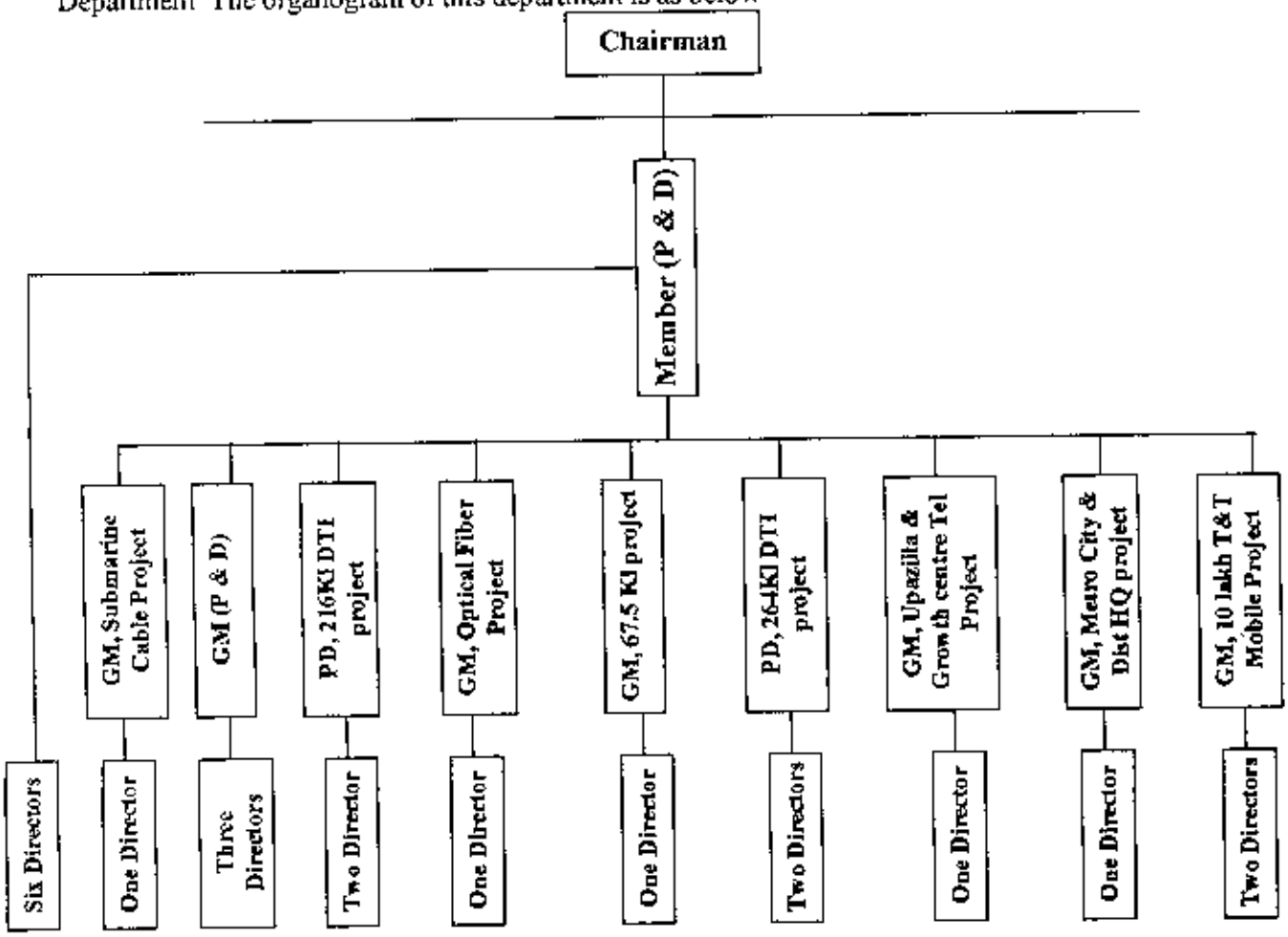


Figure 5.1

Organogram of Planning & Development Department

(Source: annual report2003-2004, BTTB, Page 4)

Though BTTB is not yet a monopoly business in telecom field, still BTTB does not bother about its selling or marketing as the demand of telephone is much more than the capacity. So the planning is mainly based on expansion of connection, improvement of the technology, facilities and overall planning.

5.2.4 Subscriber's Satisfaction

Subscriber's Satisfaction is the key parameter of quality of service for any telecommunication service provider and so for BTTB too. For the smooth operation and progress of an organization like telecom sector it is necessary to make customer satisfied.

The dictionary defines "satisfaction" as "fulfillment" or "gratification." But what we see in practical is that there are so many dilemmas between any conjunction between a customer and BTTB authority.

According to subscribers' opinion getting a new connection of telephone from BTTB is very uncertain. Also subscriber has to be harassed to resolve the problem sometime. On the other hand it also true that due to lack of telephone line, technicians and engineers the prompt service is not possible to deliver all the time. Survey result shows that 46% customers are either satisfied or fully satisfied. A considerable percentage (45%) of customers are not satisfied to their expectations.

Table 5.4: Survey Result on Telephone Customer Satisfaction

Proposition (Q-1)	Opinions	Subscribers opinion in Percentage
Any subscriber is	Fully Satisfied	11%
	Satisfied	35%
	Less Satisfied	45%
	Not Satisfied	9%

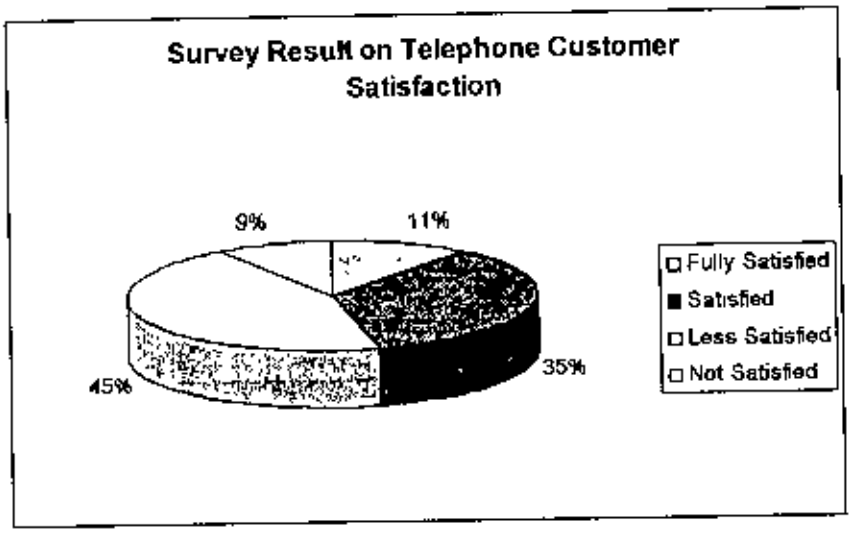


Figure 5.2

5.2.5 Reliability

Reliability is another important parameter of quality of service for telecom sector. Reliability refers to ability to perform the promised service dependably and accurately.

Table 5.5: Survey Result on Reliability

Proposition (Q-2)	Opinions	Subscribers opinion in Percentage
BTTB is reliable	YES	41 %
	NO	6 %
	No Comments	17 %
	Should be more reliable	36 %

On reliability the majority customer (59%) have reservation.

Due to the impact of monopoly the employees, especially those at lower level have direct interaction with customer, had become corrupt and unreliable on performing their task. Though at present the monopoly is broken by substitute service, their habit has not changed fully.

5.2.6 Simplicity

The technology should be easy to adopt and use for both operator and the end user .As for example making the subscriber understand the different condition of phone line BTTB use

different tones and announcement such as , ring tone, ring back tone , busy tone, busy announcement., howling tone, lock tone etc. All these are very user friendly for the subscribers. However, the survey results show that 48% of the customers do not consider it that friendly. This probably due to the fact that the customers are relatively less technology oriented, typical of developing countries with low literacy rate.

Table 5.6: Survey Result on Simplicity

Proposition (Q-4 & Q-22)	Opinions	Subscribers opinion in Percentage
The technology used in end user side	User friendly	52 %
	Problematic	11 %
	Difficult	5 %
	Not Suitable for all	32 %
BTTB telephone is better than any other way of telecommunication in respect of simplicity	Yes	30 %
	No	17 %
	Not sure	53 %

In terms of simplicity it seems that substitute services are better than BTTB's service. Mobility and connectivity is probably more demand oriented service .

5.2.7 Support and responsiveness and courtesy

This criterion says that the employees should have willingness to help customers and provide prompt service. Courtesy i.e. politeness, respect ness, consideration, and friendliness of contact personnel. It is vary from man to man. A well educated person must be well mannered. In BTTB some employees, especially lower level employees seem to have improper power and they do not know well courtesy. So subscriber can not be pleased with the attitude of overall personnel of BTTB. This is a lack of BTTB's service quality for customer.

About 90% of the customer thinks BTTB employees are unfriendly. Even talking to them is not a happy experience of about 74% of the customers.

Table 5.7: Survey Result on Support & Responsiveness

Proposition (Q-8 & Q-11)	Opinions	Subscribers opinion in Percentage
The employees of BTTB are more or less	friendly and try to help as much as possible	10 %
	rude and always acting busy	42 %
	No Comments	31 %
	very strict in rules and regulation	17 %
Talking to an employee for resolving problem is....	Easier	6 %
	not easier	59 %
	friendly and have help Line	20 %
	Not friendly and have no helpline	15 %

5.2.8 Credibility and Honesty

Credibility refers to trustworthiness and believability of the service provider. The survey shows that BTTB is not credible and honest enough. About 62% of the customers feel that BTTB is credibly provided the service. But for a country full of corruption, dishonesty and poverty it is inappropriate to blame an organization strongly.

Table 5.8: Survey Result on Credibility& Honesty

Proposition (Q-9)	Opinions	Subscribers opinion in Percentage
BTTB provide its service with proper credibility and honestly	Yes	6 %
	No	38 %
	More or less	56 %

5.2.9 Security

In analog system the security system was very lose. In digital system there are many technical provisions for giving security. But the survey shows the phone is not fully free from cross connection, illegal line connection and wrong number. Disturbances occur mainly due to unsecured necked drop wire.

Table 5.9: Survey Result on Security

Proposition (Q-10)	Opinions	Subscribers opinion in Percentage
BTTB telephone service secures from cross connection, wrong number connection or illegal line connection	yes	9 %
	Not sure	5 %
	Not fully	65 %
	No	21 %

5.2.10 Billing

Billing system and charge are the most important parameter of service quality. The rate should be economic for all classes of subscribers.

Different call rate for BTTB telephone service will be mentioned below. Before that it is important to mention that at present BTTB has multi metering system in place. The rates those are mentioned below are excluded from VAT. The government VAT is 15% for every rate.

Local Call rate:

According to BTTB authority any call below 100 km is considered as local call. In generally local call is considered within same metropolitan area and within same exchange. But according to strategic plan this rule has violated somewhere .For example though Gazipur , Savar and Narayangonj are not within Dhaka metropolitan area, any call within those area and with Dhaka are considered as local call So below 100 km can also be considered as NWD if the area does not occupy same metropolitan area. The routes for local and NWD call are mentioned in the software in every exchange clearly.

The charge for local call is 1.50 TK per pulse for all the time in a day. But in peak hour (8 AM to 10 PM) 5 minutes are considered as 1 pulse whether in off peak (10 PM to 8 AM) hour 7 minutes are considered as 1 pulse. This charge was established after introducing the multi metering system. Before that in case of non multi metering system there were no pulses. The charge was 1.50TK for one call and one call meant infinite time.

International (ISD) Call rate:

BTTB is the only authority in the country to originate and terminate calls for outside the country. But now a days some companies are doing illegal call termination which is reducing the international call revenue of BTTB vastly.

Table 5.10: International Call rate

Group	Country	Standard Rate (8 Am to 10 PM)	Off Peak (10PM to 8AM)
Group-1	India, Pakistan, Nepal, Bhutan, Maldwips, Srilanka, Thailand, Hong Kong, Singapore, Malaysia, UAE, Saudi Arabia, Qatar, Bahrain, Oman, Kuwait, Indonesia	18 TK per Minute	15 TK per Minute
Group-2	1. All other countries of ASIA those are not listed under group-1 2. United Kingdom, France, Italy, Netherlands, Australia. 3. USA, Canada	24 TK per Minute	18 TK per Minute
Group-3	1. All other countries of Europe, Australia and North America those are not listed under group-2 2. Countries and Islands of Pacific Ocean	27 TK per Minute	21 TK per Minute
Group-4	Countries of South America, Africa and rest of the countries	30 TK per Minute	24 TK per Minute

(Source. BTTB Telephone Index 2005, BSC Telecom Association, page 216)

NWD Call Charge:

From 2002 BTTB gave NWD facility to all digital telephone. Table 5.11 shows the NWD call rates.

Table 5.11: NWD Call Rate

Distance	Peak Hour (8 Am to 10 PM)	Off Peak Hour (10PM to 8AM)
0-100 Km	3.00 TK per Minute	1.50 TK per Minute
100 Km and above	4.00 TK per Minute	3.00 TK per Minute

(Source: BTTB Telephone Index 2005, BSC Telecom Association, page 217)

Economy ISD:

BTTB arranged a special rate for calling to only 10 countries with a special code such as 012. This ISD call is called economy ISD. Any telephone which has at least NWD facility can have this economy ISD facility.

Table 5.12: Economy ISD call rate

Countries	Call Rate
Australia, France, Germany, Italy, England	**Fixed-** 7.50 TK per Minute
	Mobile- 18.00 TK per Minute
USA, Canada, Hong Kong, Malaysia, Singapore	**Fixed-** 7.50 TK per Minute
	Mobile- 7.50TK per Minute

(Source: BTTB Telephone Index 2005, BSC Telecom Association, page 216)

Internet Charge:

BTTB has high speed internet facilities than other ISPs and the rate is also less. The rates for internet use are attached fully in **Appendix B.**

In every exchange there are certain storage devise for storing the bills. The storage devices are magnetic tap, optical disk, hard disk etc. Not all the exchanges have same storage and retrieve system. Bills are generated with the process of specified software installed by the respective vendors of the switching system. The belles are generated in cumulative basis . The exchange in charge engineer maintains the bill regularly. His one of the most important duty is to collect the bill from the respected storage device monthly and send the bill to the revenue office at the

end of each month so that revenue office can process the bill for the subscribes in time. In revenue office the bills are processed by subtracting the total bill achieved in last month from the bills achieved in respective month

Table 5.13: Survey Result on Billing

Proposition (Q-12, 14, 13, 16, 17,)	Opinions	Subscribers opinion in Percentage
Local Call Rate	Costly and not appropriate	23 %
	Not costly and appropriate	8 %
	Economical & reasonable	63 %
	No comments	6 %
NWD Call Rate	Costly and not appropriate	20 %
	Not costly and appropriate	19 %
	Economical & reasonable	61 %
Multi metering system is better then non multi metering system	Yes	52 %
	No	16 %
	No Comments	32 %
Subscribers get bill accurately	Yes , always	28 %
	No	9 %
	Most of the time	51 %
	Some time	12 %
Subscribers get billing copy regularly	Yes	46 %
	No	16 %
	Sometime	29 %
	Not sure	9 %

The survey results show that 71% subscribers are satisfied with present local call rate .But in case of NWD call rate 80% are more or less satisfied . Perhaps the huge reduction in call rate in NWD make customers satisfy.. Only 9% customers have objection about the accuracy of billing and only 16% subscribers have complain against the regularity of getting billing copy.

Although non multimetering system is more economical for customers, 82% of customers are not against the multimetering system.

5.2.11 Profitability

Service should be profitable for the smooth operation and proper expansion. Actual revenue collection for the financial year 2003-2004 was TK 15,311.47 million against the budgeted revenue of TK. 17,020.00 million. There was a shortage of TK.1708.00 million from the budgeted amount. This collected revenue was 0.99% less than the collected revenue of 2002-2003 financial years. In the fiscal year 2003-2004, NWD & some ITX call charges had been reduced. In spite of substantial reduction of traffic, BTTB could achieve almost similar level of profit as the previous year..*[1]*

Table 5.14: Survey Result on Profitability

Proposition (Q-21)	Opinions	Subscribers opinion in Percentage
BTTB is Profitable organization of Government	Yes	70 %
	No	8 %
	Don't know	22 %

Table 5.14 shows that the perception of the customers as the profitability of BTTB Customers perception is close to the real situation as shown in Table 5.15.

A comparison of revenue collection, expenditure & surplus for the last five years from 1999-2000 to 2003-2004 are shown in table 5.15

Table 5.15

A Comparison of Revenue Collection, Revenue Expenditure and Surplus

Year	Revenue Collection	Expenditure	Surplus
1999-2000	14006.76	4864.82	9141.94
2000-2001	13052.19	3904.54	9147.65
2001-2002	15830.52	4635.41	11195.11
2002-2003	15448.00	5884.31	9563.69
2003-2004	15311.47	6268.74	9042.73

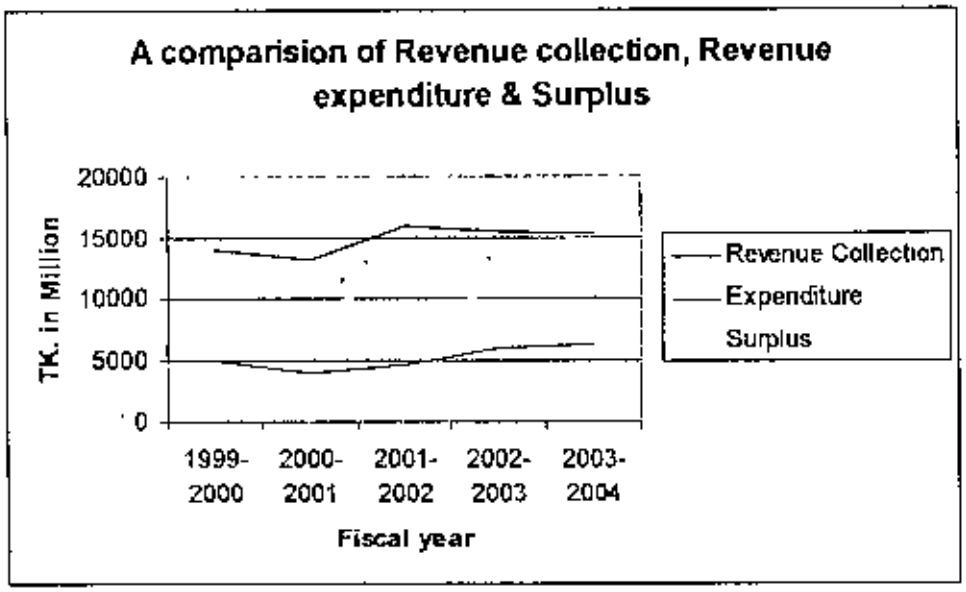


Figure 5.3

5.2.12 Understanding the customer

The Authority should be making the effort to know customer and their needs. The survey results below shows that there are no such arrangement to collect the information of the needs of subscribers and to full fill them. As a monopoly autority BTTB did not bother to think of that.As a result the customers consider BTTB as a not so friendly business organization as seen from Table 5.16

Table 5.16: Survey Result on Understanding the customer

Proposition (Q-19)	Opinions	Subscribers opinion in Percentage
BTTB consider the needs of subscriber and try to give prompt service	Yes	23 %
	No	37 %
	Don't know	40%

5.2.13 Availability of new connection:

The total capacity of phone line is really poor in BTTB. But the demand is very high.

According to survey result most subscribers said that the procedure for getting new connection is very difficult and it is noticeable that not a singe subscriber said that the procedure is easier and systematic. Actually as a government body BTTB has to go through the complex process defined by Government. So many papers have to be filled up by both the subscriber and the authority. Moreover as the line is limited, verification, priority basis, free connection etc have to be considered. All those process take much time to get the final order for getting connection. The responses of the customers on the procedure of getting new connection really portray a sad situation. They are not usually unhappy, a good percentage (33%) of them think the process is either not transparent or corrupt.

Table 5.17: Survey Result on New Connection

Proposition (Q-25)	Opinions	Subscribers opinion in Percentage
The procedure for getting a new telephone connection is	Easier and systematic	0 %
	Very difficult	67 %
	Not clear enough to customer	11 %
	Full of corruption	22 %

5.2.14 Value added services

Beside voice communication there are many value added services such as Call Forwarding, call conferencing, wake up service, Locking, Telex, Internet etc. Most of the switching system, in BTTB, have those facilities more or less. But the survey shows not all customers are not aware of all these facilities. This is because BTTB hardly advertise their services. More over in the past some customers misuse of the facility of call diverting and call forwarding led to unwarranted difficulty for BTTB. However, more than 80% of the customers feel that BTTB should not only advertise for their existing V.A services, they should also add few more high-tech VA services.

Table 5.18: Survey Result on Value Added services

Proposition (Q-24 & Q-29)	Opinions	Subscribers opinion in Percentage
All the facilities provided by the BTTB c are known...	Fully	3 %
	Most of them	54 %
	A few	26 %
	Don't know	17 %
BTTB should provide more value added services like SMS, MMS and advertise the existing services.	Yes	83 %
	No	14 %
	No Comments	3 %

5.3 Network Service Quality

Table 5.19 shows the network performance of BTTB according to the opinion of subscribers. Majority of the subscribers think the network performance is not sufficient.

Table 5.19: Survey Result on Network Performance

Proposition (Q-23)	Opinions	Subscribers opinion in Percentage
The network performance of BTTB is	Very Well	40 %
	Faulty	3 %
	Sometimes well sometimes faulty	43 %
	Don't know	14 %

5.3.1 Speed

In BTTB most of the telephone exchange are digital now a days. So the voice speed of network shall be calculated for digital switching system only. BTTB used Circuit Switching system for its PSTN communication.

Our voice signal is actually an analogue signal. Using PCM (Pulse Code Modulation) technique the analogue signal is converted into digital signal. We know the voice signal has the frequency range of 0.3 KHz to 3.4 KHz. For simplicity frequency range of 0 KHz to 4KHz is used in BTTB for voice communication.

So our Voice signals are band limited to 4 KHz and according to the Nyquist Sampling theorem the sampling frequency is 8 KHz (4 X 2=8) or 8000Hz

Therefore the Time period of sampling $T_s = \frac{1}{8000}$ sec = 125 μsec

In BTTB 32 Channel Frame or PCM is used. The commercial name of a frame is **E-1**.In E-1 one channel or one time slot has the capacity to have 8 bit signal.

The time available for per channel= $\frac{T_b}{N} = \frac{125}{32} = 3.9\mu sec$

Sampling Speed= 8000 Hz or Cycle/sec ; Time for one E-1=125 μ sec ; Each Channel= 8 bit

So. Speed of one Voice channel of an E-1= 8 bit x 8000 Cy/sec

= 64000 bit/sec

= 64Kbps

Speed of one PCM or Frame or E-1=32 x 64 Kbps

= 2048 Kbps

$\approx 2Mbps$

With that speed a 0.4 mm Copper cable can cover 4 km distance from MDF(Main Distribution Frame, which connects outside wire and the E-1 of the exchange) to subscriber telephone set for sufficient capacity of voice communication

Table 5.20: Survey Result on Speed and Accuracy

Proposition (Q-22)	Opinions	Subscribers opinion in Percentage
BTTB telephone is better than any other way of telecommunication in respect of Speed and Accuracy	Yes	30 %
	No	17 %
	Not sure	53 %

5.3.2 Reliability

For achieving accuracy there are provision for redundancy for the important equipments such as processors, hard disks etc in every switching. There are redundancy provision in the form of dual, triple or (n+k). Generally in BTTB (n+1) or (n+2) redundancy is used for smooth and uninterrupted operation. (n+1) means n equipments are in operation and other is on stand by.

Table 5.21: Survey Result on Disturbance

Proposition (Q-3)	Opinions	Subscribers opinion in Percentage
BTTB Provided service without disturbance, noise and error	Yes, all time	5 %
	Yes , satisfactorily	14 %
	Not all time	75 %
	Never	5 %

5.3.3 Availability

In BTTB the switching outlet from E-1 is designed as 4:1 i.e. the capacity of switching for a particular exchange is designed such that ¼ th of the total subscriber of that exchange can communicate or can have a free channel at the any time. It should be mentioned here that in developed country the outlet is designed as 8:1 due to their low density of population and ITU recommends that up to 16:1 can be designed too. Considering those conditions, subscriber has more availability to have free channel most of the time in BTTB telephone network.

BTTB use sufficient battery backup in each exchange so that interruption of PDB power can not make the exchanges fully dead.

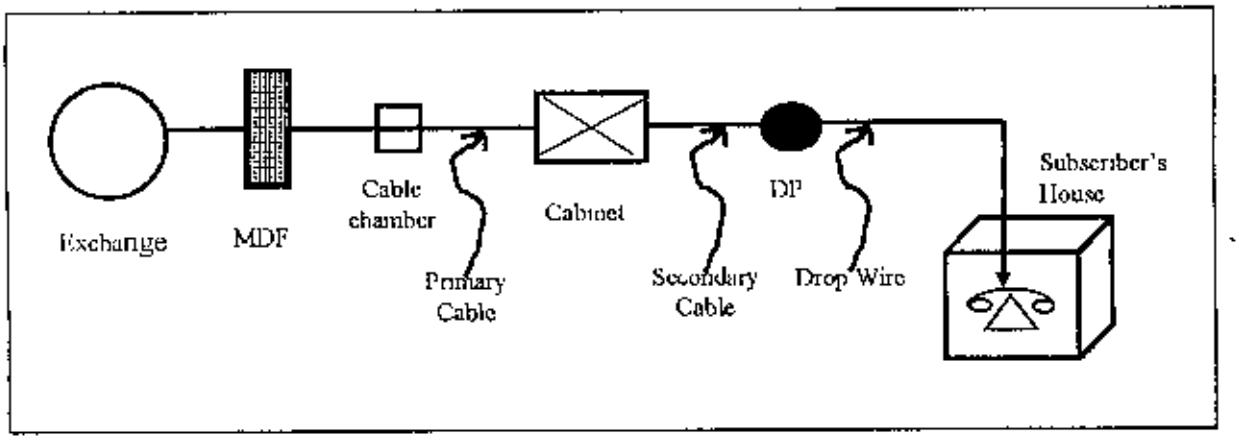


Figure 5.4

Simplest Network for a Telephone Connection in BTTB

5.3.4 Simplicity

Digital switching systems are fully software controlled. So it is very easy for the engineers to operate, maintain and monitoring the switching system.

Giving connection to a new subscriber is very simple. Because for a particular exchange the total capacity of line has been built up at the time of installation. Moreover in outside of the MDF cable has already been laid up to cabinet or Distribution Pole (DP) Box near the premises of subscriber. So for giving a new connection two technical job have be done

- The exchange incharge has to give necessary software command and
- Give connection with the drop wire from DP to telephone set

5.3.5 Security

The telephone line is very much secured from outside illegal connection or eves drop from exchange to MDF. But after MDF the buried wire, drop wire, DP box or Drop wire all are in the public places so interruption is not impossible. Especially drop wire is very unsecured.

In exchange every line is highly software protected for each and every switching system.

5.3.6 Fault Repair Capability

BTTB installed all the switching from world famous vendors. So in every switching there is provision for all the fault repair more or less. The digital system is fully computerized. So fault location is very easy especially inside the MDF and exchange. But sometime in outside there occur some unwanted fault which are much difficult to locate and resolve. Also some faulty equipment is difficult to replace if replacement is necessary as the extra is not available all time. This happens most of the time in case of line card. So the solution is often lengthy and as such customers opinion reflected in Table 5.22 is quite obvious.

Table 5.22: Survey Result on problem solution

Proposition (Q-5)	Opinions	Subscribers opinion in Percentage
The problems are resolved quickly	Resolved as early as possible	8 %
	Solved but need much time	47 %
	Depends on extra payment	38 %
	Never solved	6 %

In survey most of the subscriber said that the problems are solved but long time after the complain. The delay is not always technical or bureaucratic. The people involved in the process are also responsible at times.

5.3.7 Using modern Technology

BTTB use Circuit switch technology in its PSTN telephone. But in modern technology Packet switch or Soft switch is available, which is very faster and advantageous for communication a Circuit switch. But changing the whole system is quite difficult and need much time.

More over previously BTTB used PDH technology for digital voice data transmission but gradually BTTB replaced this technology by SDH as SDH is more advantageous . A comparison between them is shown below

The Plesiochronous Digital Hierarchy (PDH):

- PDH is NOT designed for high rates
- is based on three different standards
- does not provide optical interconnections for interfaces supplied by different manufacturers
- defines a cost intensive and fairly inflexible multiplexing structure
- has a low binary rate dedicated for monitoring and a limited transmission quality
- does not provide centralized network management
- has an exclusively point-to-point connection topology
- The PDH standards were approved by the ITU-T in 1988 (G.702)

Synchronous Digital Hierarchy: SDH

- The SDH results from the SONET concepts proposed in the USA.
- The first SDH standards were approved by the ITU-T in 11/1988
- (recommendation series G.7xx):
- They define the rate, the frame and the multiplexing processes.
- It can avoid multiplexing module
- The SDH is an international, high-rate telecommunication networks standard.
- The SDH is defined as an assembly of normalized digital transport structures.
- The SDH provides centralized network management.
- Network can manage and monitor from one station
- Need less equipment

BTTB uses PDH for local switching network and SDH for transmission network mainly.In case of Internet facility BTTB used many new and sophisticate technology.

5.3.8 Competence

Competence refers to the possession of the required skills and knowledge to perform the service. In BTTB the engineers (Assistant Divisional Engineers and above) are recruited through Bangladesh Civil Service (BCS) examination conducted by the Public Service Commission (PSC). So there should not be any doubt about the qualification and merit of the 1st class employees of BTTB. Moreover these engineers have to go through a 2 years long training period before they deliver the full phase service and in the service life they also get many chance of having training both inside the country and abroad. The diploma engineers, technicians and all other employee for revenue post are recruited through proper examination. However, some nepotism and consequent poor recruitment cannot be ruled out.

5.3.9 Flexibility

Manufacturer designed the switching system with high flexibility, so that it can updated as necessary. The recent switching systems are more reliable than old systems.

4.3.10 Profitability

The overall system should be cost effective. In BTTB different tuypes of switching system is used such as NEC(Japan), Erricsson (France),Alcatel(France), ZTE(Chaina) etc.

The maintenance and operating cost of them are not same. For example in case of newly installed Mercury Switching system (Korea) the power consumption is only 0.63 Watt per line but in other case it is more than 1 watt.

5.3.11 Traffic management

The exchange in charge always monitor the traffic carefully because it will help in future planning for expansion of connection and giving other facilities

5.3.12 Signaling

For perfect communication signaling is very important.. If one subscriber does not get suppose, ring tone signal the telephone seems to be dead to him. In this way other signaling and announcements are also very important for their respective purposes. For this reason in every switching centre enough channels are always designed with proper redundancy so that each and every subscriber can achieve all the necessary signals without interruption.

CHAPTER 6

RECENT PROGRESS AND DEVELELOPMENT OF SERVICE QUALITY OF BTTB

6.1 Growth of Telephone in Bangladesh

The growth of telephone exchange capacity in Bangladesh in the last five years was on average only 77,000 lines per year. The recorded pending demand of telephone has been increasing at a faster rate than the telephone expansion. Table 5.1 and fig 5.1 show the past trend of telephone growth in Bangladesh from 1999-2000 to 2003-2004 fiscal year.

Table 6.1: Telephone Growth in Bangladesh

Year	Type of Exchange	No of Exchange	Exchange Capacity	Telephone Connection	Pending Demand	Unutilized Capacity
1999-2000	Manual	476	45845	39045	21769	6800
	Auto(Analog)	102	139420	115606	18220	23814
	Auto(Digital)	65	394529	336652	95125	57877
	Total	**643**	**579794**	**491393**	**135114**	**88491**
2000-2001	Manual	440	41815	34672	18903	7143
	Auto(Analog)	90	107720	70690	18307	37030
	Auto(Digital	131	539825	459518	161900	80307
	Total	**662**	**688920**	**564880**	**199110**	**124040**
2001-2002	Manual	416	39293	32449	21997	6844
	Auto(Analog)	84	55598	45182	10484	10416
	Auto(Digital	168	651187	528300	178630	122887
	Total	**668**	**746078**	**605931**	**211111**	**140147**
2002-2003	Manual	359	33260	26045	24017	7215
	Auto(Analog)	53	18820	13640	6592	5180
	Auto(Digital	240	868913	677036	171243	191877
	Total	**652**	**920993**	**717721**	**201852**	**203272**
2003-2004	Manual	324	30953	32948	20572	8005
	Auto(Analog)	43	17700	11495	6055	6205
	Auto(Digital	271	917696	775715	150115	141981
	Total	**638**	**966349**	**810158**	**176742**	**156191**

(Source: Annual Report 2003-2004,BTTB,page17)

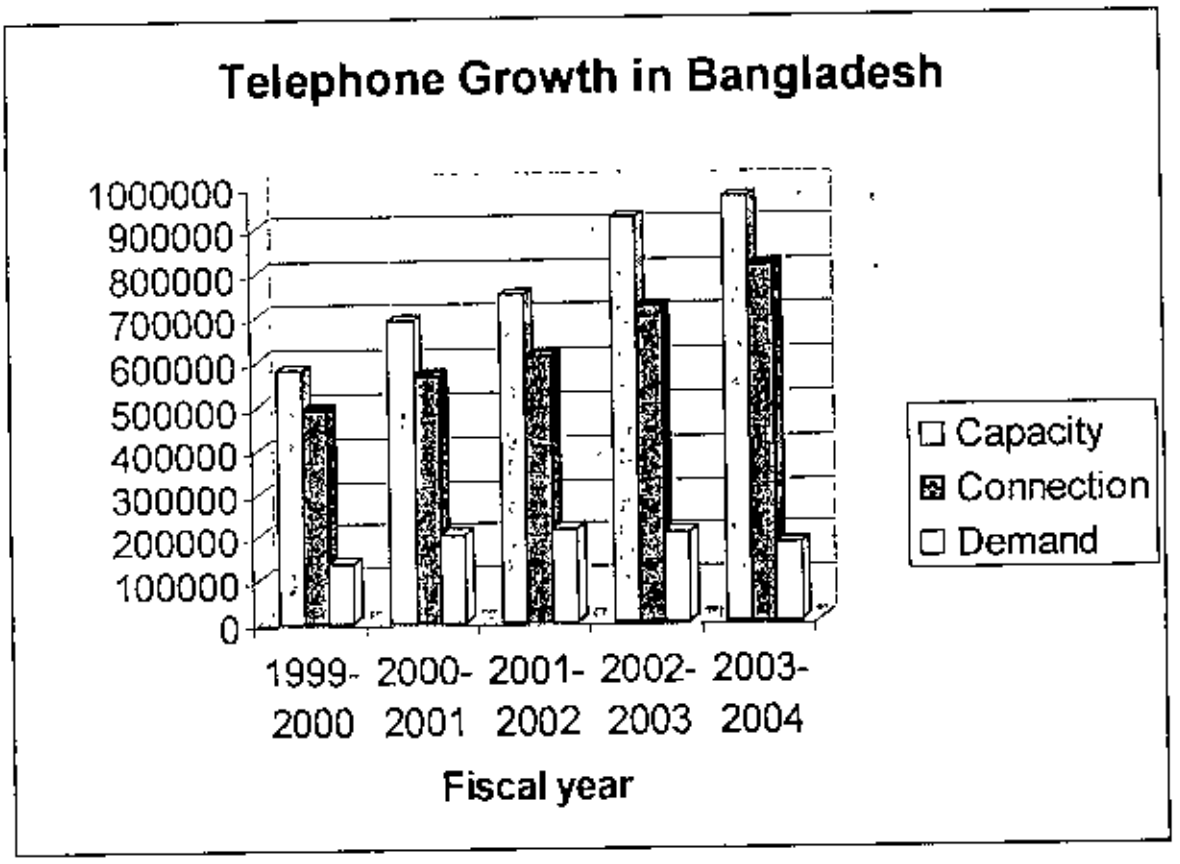


Figure 6.1

From Table 6.1 we found that in every year a huge no of lines remained unutilized .With that access capacity the pending demand should be fulfilled. But actually according to strategic decision of authority of BTTB a significant no of lines are kept free. So that those lines can be used at any time for emergency basis for the important sector of Government or for the VVIP persons. If some important connections become faulty then those lines will give back up support. As a rough calculation for the year 2003-2004 the unutilized capacity for each exchange are = (156191/638) = 244.81, this free lines are not much more for an individual exchange.

Table 6.2 and figure 6.2 shows the rate of change of growth of telephone capacity, connections and pending demand.

Table 6.2: Rate of Change in Growth of Telephone in Bangladesh

Year	Change in number of Exchange	Change in number of Exchange Capacity	Change in number of Telephone Connection	Change in number of Pending Demand
2000-2001	+19	+109126	+73487	+63996
2001-2002	+6	+57158	+41051	+12001
2002-2003	-16	+174915	+111790	-9259
2003-2004	-14	+45356	+92437	-25110

(Source: Table 6.1, Page55)

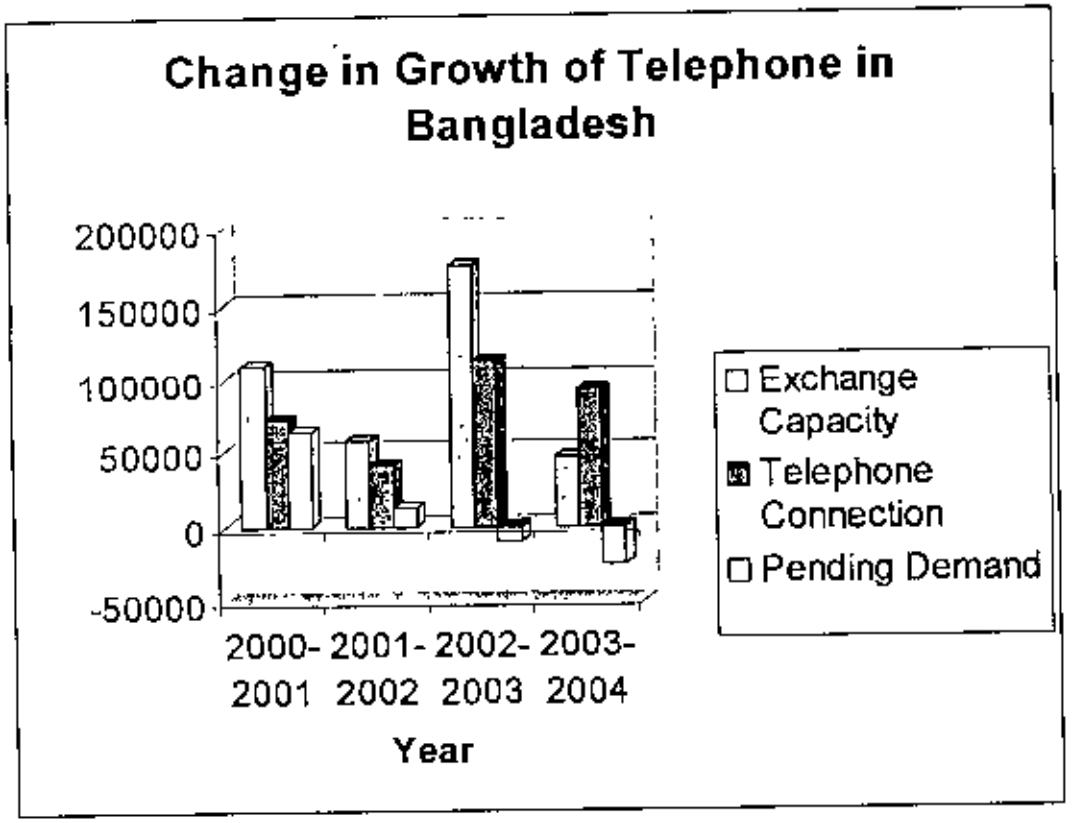


Figure 6.2

6.2 List of the Project in ADB (Annual Development Program) of BTTB

Following project under BTTB are included in the Annual Development Program (ADP) during the fiscal year 2003-2004: *[1]*

1. Greater Dhaka Telecommunication Improvement (Phase-II) (Under JBIC, Japan Loan)
2. 2,66,000 lines Digital Telephone Installation (Including conversion of 76,000 lines to digital system)
3. Installation of high capacity Optical Fiber System between Dhaka-Chittagong including spur transmission link.
4. Installation of Digital Telephone Exchanges at Sreepur, Kapasia, Kaliganj, Kaliakoir,Tongi and some other growth centre under Gazipur district.
5. Installation/expansion of Digital telephone exchange in various district of Bangladesh (Under PR China Credit)
6. Establishment of International Telecommunication System Through Submarine cable.
7. Installation of Internet Service on emergency basis in all districts.
8. Installation and replacement of Radio links in different Upazillas in Bangladesh.
9. Installation of Digital Telephone Exchanges at Chittagong, Khulna and Sylhet(Under EDCF, Korea Loan)
10. Installation of Digital telephone Exchange at Upazillas and Growth Centres
11. Installation of Digital Telephone Exchanges in Metropolitan Cities & Important district town(1st phase 1,10,000 lines)
12. Installation of Digital Radio Links andTelephone Exchanges at Chittagong Hill Tracts (Under PR China Credit)
13. 10 lakh T& T mobile Telephone(First Phase—2.5 lakh)
14. Installation of Digital Telephone Exchange at Keraniganj Upazilla in Dhaka district.
15. Installation of Digital Telephone Exchanges at Mujib Nagar Complex in Meherpur District.
16. Introduction of Pre-Paid service by BTTB.

Table 6.3

Installation of Digital Lines under BTTB in 2003-2004 fiscal year

SL	Name of the Project/Program	Description		Total installed capacity
1	Greater Dhaka Telecom Network Improvement Project (Phase-II)	Rehabilitation only of fire damaged 12000 lines capacity Chawkbazar exchange completed		Rehabilitation only
2	266000 lines digital telephone installation (including conversion of 76,000 lines analog telephone)	Khilgaon	6000 Lines	31,300 Lines
		Nilkhet	4000 Lines	
		Mirpur	2000 Lines	
		Cantonment	5000 Lines	
		Banasree	1000 Lines	
		Goran	1000 Lines	
		Mugdapara	1000 Lines	
		Mohanagar	1000 Lines	
		Narayanganj	3000 Lines	
		Sub-Total Dhaka	**24,000Lines**	
		Chittagong Cebtral	4000 lines	
		Sub-Total Chitagong	**4000 Lines**	
		Alampur	2000 Lines	
		Tajpur	300 Lines	
		Sub-Total Sylhet	**2300Lines**	
		Rupsha	300 Lines	
		Dighalia	200 Lines	
		Sub-Total Khulna	**500 Lines**	
		Naohata	500 Lines	
		Sub-Total Rajshahi	**500 Lines**	
		Total installed capacity under the project		
3	Installation of digital telephone exchanges at Sreepur, Kapasia,Kaligonj, Tongi and some Growth Centres under Gazipur district	Sreepur	1000 fixed + 200 WLL LinesLinesLines	17000 Fixed Lines +200 Radio Access Lines
		Kapasia	1000 Fixed Lines	
		Kaligonj	500 Fixed Lines	
		Kaliakoir	1000 Fixed Lines	
		Tongi	5500 Fixed Lines	
		Board Bazar	3000 Fixed Lines	
		Konabari	2000 Fixed Lines	
		Rajendrapur	1000 Fixed Lines	
		Shalna	2000 Fixed Lines	
		Total installed capacity under the project		

(Source: Annual Report 2003-2004, BTTB, page 19)

Table 6.4

Installation/Expansion of Transmission Links under BTTB in 2003-2004 fiscal year

Sl.	Name of Project		Name of Route/Link	Means of System	Types of System	Bandwidth of Route/Link
		1	Chuadanga-Meherpur	OFC	SDH	155 MBPS
1	Installation and Expansion of Digital telephone Exchanges in Various Districts of Bangladesh .	2	Meherpur-Kushtia	OFC	SDH	155 MBPS
		3	Thakurgaon-Panchagarh	OFC	DH	155 MBPS
		4	Dinajpur-Saidpur	OFC	SDH	155 MBPS
		5	Rangpur-Thakurgaon	OFC	SDH	155 MBPS
		6	Rangpur-Saidpur	OFC	SDH	155 MBPS
		7	Sidpur-Nilphamari	OFC	SDH	155 MBPS
		8	Rangpur-Polashbari	OFC	SDH	622 MBPS
		9	Bogra-Polashbari	OFC	SDH	622 MBPS
		10	Sirajganj-Sahjadpur	OFC	SDH	155 MBPS
		11	Sahjadpur-Pabna	OFC	SDH	155 MBPS
		12	Mymensingh-Sherpur	OFC	SDH	155 MBPS
		13	Satkhira-Khulna	OFC	SDH	155 MBPS
2	Installation and replacement of various Radio Link s in Bangladesh	14	Rangamati-Betbunia	OFC	SDH	155 MBPS
		1	Bogra-Talora	MW	PDH	34 MBPS
		2	Bogra-Gabtali	MW	PDH	34 MBPS
		3	Bogra-Shibganj	MW	PDH	34 MBPS
		4	Bogra-Dhunat	MW	PDH	34 MBPS
		5	Bogra-Sonatala	MW	PDH	34 MBPS
		6	Bogra-Nandigram	MW	PDH	34 MBPS
		7	Natore-Singara	MW	PDH	34 MBPS
		8	Jaypurhat-Panchbibi	MW	PDH	34 MBPS
		9	Jaypurhat-Akkelpur	MW	PDH	34 MBPS
		10	Dhaka (savar)-Dhamrai	MW	PDH	34 MBPS
		11	Manikganj-Saturia	MW	PDH	34 MBPS
		12	Manikganj-Doulatpur	MW	PDH	34 MBPS
		13	Manikganj-Shibalya	MW	PDH	34 MBPS
		14	Mymensingh-Muktagachha	MW	PDH	34 MBPS
		15	Jamalpur-Dewanganj	MW	PDH	34 MBPS
3	Installation of Digital Tel. Exchanges in Sreepur, Kapasia, Kaligonj, Tongi, kaliakoir and some growth centre under Gazipur District	1	Gazipur-Board Bazar	MW	PDH	34 MBPS
		2	Gazipur-Konabari	MW	PDH	34 MBPS
		3	Gazipur-Rajendropur	MW	PDH	34 MBPS

[OFC=Optical Fiber Cable ; MW= Microwave ; SDH=Synchronous Digital Hierarchy ; PDH= Plesiochronous Digital Hierarchy; DH= Digital Hierarchy]

(Source: Annual Report 2003-2004, BTTB, page 20

With the completion of all those projects The capacity of BTTB will be increase much. Moreover people out side the metropolitan area can also get opportunity to have more telephone line connections. On the other hand the installation of new Transmission links will strengthen the network backbone of BTTB. With this NWD call could be available more. Moreover BTTB can rent their backbone more to others operators after fulfill own needs.

6.3 Progress on access to International Broadband Super Highway through Submarine Cable

BTTB is implementing a project with title "Establishment of Telecommunications System through Submarine Cable" in order to enable Bangladesh to success to international broadband super highway through under sea submarine cable. The entry of Bangladesh into the consortium of Submarine Cable as a very big achievement. The Submarine Cable Network called as South-East Asia, Middle-East and West Europe-4 (SEA-ME-WE) will connect the countries including Indonesia, Singapore, Malaysia, Bangladesh, India, Sri Lanka, Pakistan, United Arab Emirates, Saudi Arabia, Egypt, Italy and France.. In fact, a new door has just been opened for Bangladesh. The project with an approximate capacity of 1.28 terabyte with the use of most modern DWM technology is expected to be completed by the year 2004 for providing service to the customers.

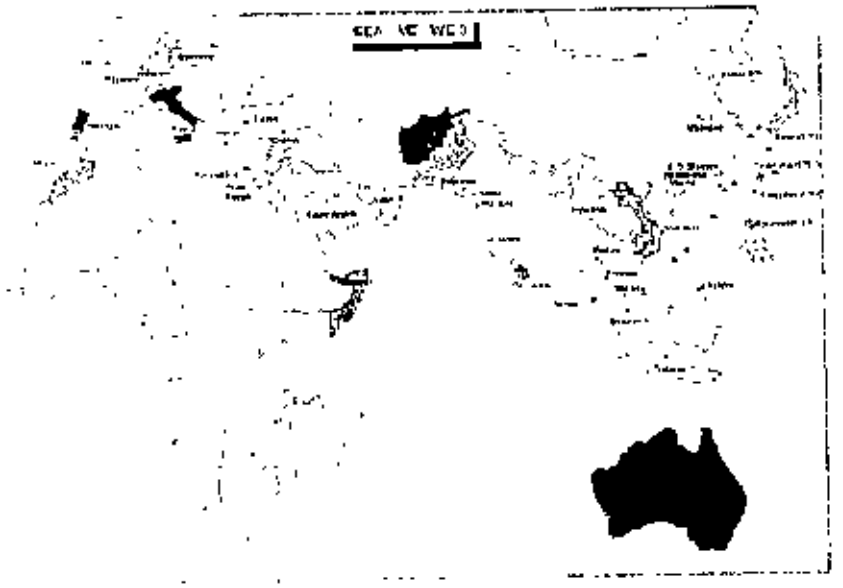


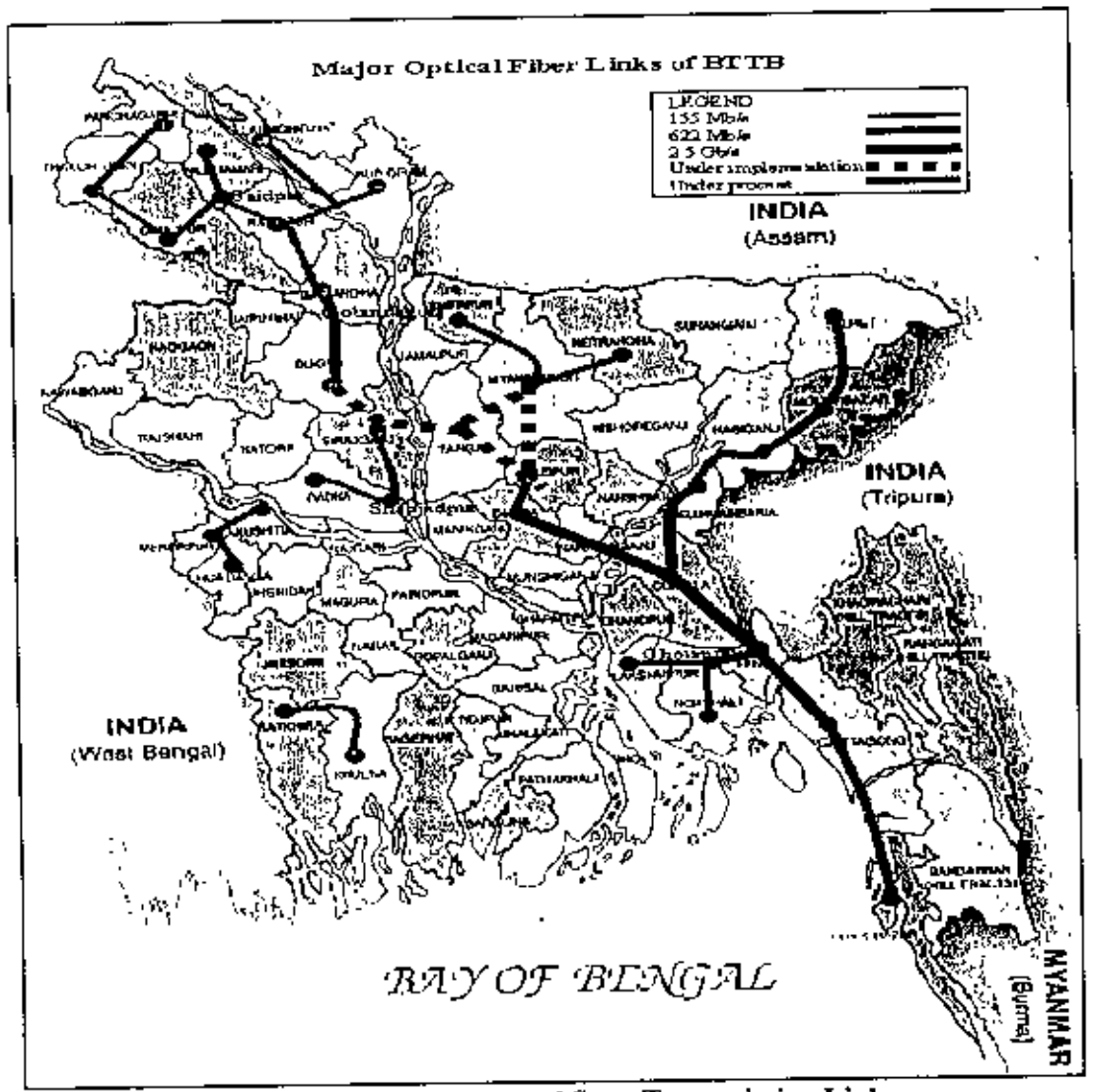
Figure 6.3

The global route taken by SEA-ME-WE-3 (Optical fiber cable system-3 connecting South East Asia, Middle East and Western Europe)

On this regard following achievements are being made by BTTB during fiscal year 2003-2004, through implementation of the said project.

1. Signing a Construction & Maintenance Agreement (C&MA) among 16 parties of the SEA-ME-WE-4 Construction.
2. Signing of supply contract by the SEA-ME-WE4 Construction with M/S Alcatel of France and M/S Fujitsu of Japan for installation of the Submarine Cable.
3. Completion of land development for cable landing station site at Cox'sbazar. *[Ref.1]*

Figure 6.4



Optical Fiber Backbone and Spur Transmission Link

6.4 Installation of Internet & Data communication Facilities in Bangladesh

After completion of a project for installation and commissioning of a Packet Switched Public Data Network (PSPDN), BTTB has introduced Internet Services for the subscribers. BTTB has plans to enhance the facilities available in the existing DDN (Digital Data Network). BTTB is gradually expanding its network to act as facility provider to private ISPs Internet Service Providers) in order to contribute to the fast growing of internet services and IT (Information Technology) sector in Bangladesh.

During the fiscal year 2003-2004, BTTB has made expansion of PSPDN, DDN and Internet Services through implementation of projects namely "Greater Dhaka Telecom, Network Improvement Project (Phase-II) and "Installation of Internet Service on emergency basis in all districts" and through implementation of some programs under maintenance budget. Internet Services has been introduced by BTTB in all district town and some Upazilla towns of Bangladesh by June, 2004.

Enhanced network facilities have also been provided to ISPs. This project has provision for development of necessary infrastructure for interconnection, different ISPs would be enabling to use BTTB's platform instead of using costly VSAT system. Banks, multinational companies, government, non government organizations and corporate bodies will get access to high speed digital data communication network after implementation of this project. This will open a new horizon about exchange of information that will improve efficiency in management and commercial activities in the country.

From November, 2005 BTTB is fully providing the DDN facilities. The various categories of having connection and rates are attached in **Appendix B.**

6.5 Other Major Programs under implementation through the ADP enlisted projects

1. Under project namely "266KL digital telephone installation ". a number of national transmission links will be built up. These are optical fiber cable routes of Dhaka-Mymensing-Tangail-Sirajgang-Bogra, Bogra-Natoire–Rajshahi, Rajshahi-Chapai nawabganj and a number of OFC (Optical Fiber Cable)super links.

2. Under the project titled "Installation and expansion of digital telephone exchange in various district of Bangladesh" digital telep[hone exchange will be installed ar additional 31 upazilla & growth center. In addition to optical fiber cable links between Brahmanbaria-Moulavibazar-Sylhet and some other spur OFC links will be installed.
3. Under "Installation and replacement of radio links in different upazillas of Bangladesh" project, installationof remaining radio links will be completed in 2004-2005 fiscal year for connecting additional 35 Upazilla/growth centre with there respective district head quarters.
4. Under "Installation of digital telephone exchange at Chittagong, Khulna,& Sylhet" project, about 1,01,300 line digital telephones and inter exchange optical transmission links will be installed.
5. Under "Installation of digital telephone exchange in Upazilla and growth centre " project , digital telephone Switching will be installed at remaining upazilla headquarters, where at present there is no digital telephone facility. Digital Switching will be installed at some growth centres as well as 220 number Remote Switching Unit (RSUs) and 220 number digital radio transmission links will be installed .
6. Under "Installation of digital telephone exchange in metropolitan cities & important districts" project, 110,000 lines digital telephone along with inter exchange optic cable transmission link and a few optical access will be installed.
7. Under "Installation of digital telephone exchange in upazilla and growth centre" project , digital telephone Switching will be installed at all remaining upazilla headquarters, where at present there is no digital telephone facility. Digital switching will be installed at some growth centres as well as 220 number Remotw switching Units (RSUs) and 220 number digital radio transmission links will be installed.
8. Under "Installation of digital telephone exchange in metropolitan cities& important districts" project, 110,000 lines digital telephone along with inter exchange optic cable transmission link and a few optical access network will be installed .
9. Under "Installation of digital radio link& digital telephone exchange at Chittagong" project, total 6900 lines digital telephone at 23 locations(Upazilla & growth centre) and 27 numbers radio links under Bandorban, khagrachhari & Rangamti districts will be installed.

10. the project with tittle"10 (ten) lakhs T&T mobile telephone (1st phase 2.5 lakhs)" has a scope for installation of 2.5 lakhs mobile telephone (with GSM technology) at district towns and along few major highways.
11. Under "Installation of digital telephone exchange at keraniganj upazilla in Dhaka district" project total 5000 digital telephones will be installed at Keraniganj Zinjira and Kalatia.
12. major scope of work under "Introduction of pre-paid services by BTTBare", installation of an IN(Intelligent Network) Platform, with associated equipment for 200000 Pre-paid calling card, Pre-paid Telephony Subscriber , free Phone Subscriber facility . *[Ref.1]*

With the implementation of all those projects the telephone capacity of BTTB will also be increase much. Moreover people out side the metropolitan area and rural area can also get opportunity to have more telephone line connections. On the other hand the installation of new Transmission links will strengthen the network backbone of BTTB. With this NWD call could be available more. Moreover BTTB can rent their backbone more to others operators after fulfill own needs

6.6 BTTB plans E-1 system for ISP's connection to ease network pressure

BTTB plans E-1 system to ease network pressure Microwave facility, coaxial connections to help ISPs.With a view to reducing pressure on its fixed lines and facilitating operations for the Internet Service Providers (ISPs), the Bangladesh Telegraph and Telephone Board (BTTB) is likely to introduce the European Standard-1 (E1) system shortly.

"Introduction of E1 system would release nearly 6,000 fixed BTTB telephones, now used as access lines for the ISPs," a highly placed source in the board said.

Once the system is put in place, the BTTB would distribute these free lines to prospective telephone subscribers. The board has plans to provide microwave facilities and coaxial cable connections to the individual ISP in the absence of a fiber-optics network, he added. Installation work has almost been completed. The E1 would also help ease pressure on the BTTB network at night when most Internet users hook up to make most of off-peak hours.

Up to November 2005 very few ISPs has accept this system

E-1 system for connection of ISPs will reduce the extra burden on telephone line . So the PSTN service quality will be more available. This will thus improve service quality. Moreover access of internet qill be more faster and easier with that system.

The BTTB would also offer a lower charge for ISPs willing to get connection through E1 cable. The rates are attached in **Appendix B.**

6.7 Restructuring of BTTB

The five-member taskforce on restructuring the Bangladesh Telegraph and Telephone Board (BTTB). which was formed on January 9, 2003, suggested that the board be transformed into a state-owned company under the Companies Act 1994.

The taskforce also asked the government to form a nine-member board of directors for the Company and vested the board with full financial autonomy. It also suggested a roadmap for restructuring the board into a company and said that, unless the board is given full financial autonomy, it would lose out in the ever-shifting telecom market. The roadmap follows the Pakistan model. which transformed its telecom board into a company successfully, with government owning its full equity. However, Goldman Sachs, a world-famed investment bank, planned the roadmap for restructuring the Pakistan Telegraph and Telephone Board. The taskforce in its report also recommended amendment to the BTTB Act 1979 an formation of a separate pay scale and service rule for the company and an option for voluntary retirement or golden handshake for the willing employees.

It held various rounds of meeting with the CBA leaders of the board, the employees" union and also met the leaders of the BCS Telecom Association. All their views were also incorporated in the report. The report said the government would hardly incur any revenue loss if the board is transformed into a public limited company. In the fiscal year 2003-2004 BTTB, one of the government non-tax cash cows, earned Tk 15.31 billion operating profit and paid around Tk 9 billion as net profit to the government exchequer. The report said that if the board is made a public limited company, BTTB would be able to deposit minimum Tk 10 billion to the public exchequer annually. Whereas five private telecom companies deposit Tk 6.80 billion a

year*[Ref.18]*. In its report, the taskforce highlighted how the state-owned telecom companies in the region brought qualitative changes in their performance after being transformed into state-owned or partly privatized telecom companies. Though the taskforce has not set any deadline for the restructuring of the telecom behemoth, it suggested that sooner the BTTB is transformed into a company; the better is for its survival. The taskforce, however, suggested total auditing of the BTTB"s assets by audit firms before transforming it into a state-owned public limited company in full accordance with the government's Article of Association. Under the changed setup, the BTTB management can take loan from the banks, can make its own decision on its investment and procurement plan and then set its tariff according to its own plan.

Till today the decision is pending and discussion is going on with uncertainty of the privatization. Survey result shows that most of the customer wants privatization of BTTB.

Table 6.5: Survey Result on Privatization

Proposition (Q-30)	Opinions	Subscribers opinion in Percentage
Privatization of BTTB is Necessary	Yes	44 %
	No	12 %
	Not now, later on	32 %
	No Comments	12 %

6.8 International Telecommunication

To meet the existing and future demand of overseas traffic, BTTB is continuously trying to increase the number of international circuits with other countries. By June, 2004, BTTB, through 4 satellite earth stations, established6326 international direct circuits with 37 operator of 27 countries and transit circuits with 171 countries. *[Ref.1]*. Table 6.6 and figure 6.5 and 6.6 show the growth clearly.

Table 6.6: Growth of International Voice circuits

Year	Circuits	Growth Rate
June,2000	2302	—
June,2001	2767	20.20%
June,2002	3327	20.23%
June,2003	3730	12.11%
June,2004	6326	69.60%

[source: Annual report 2003-2004,BTTB, page14]

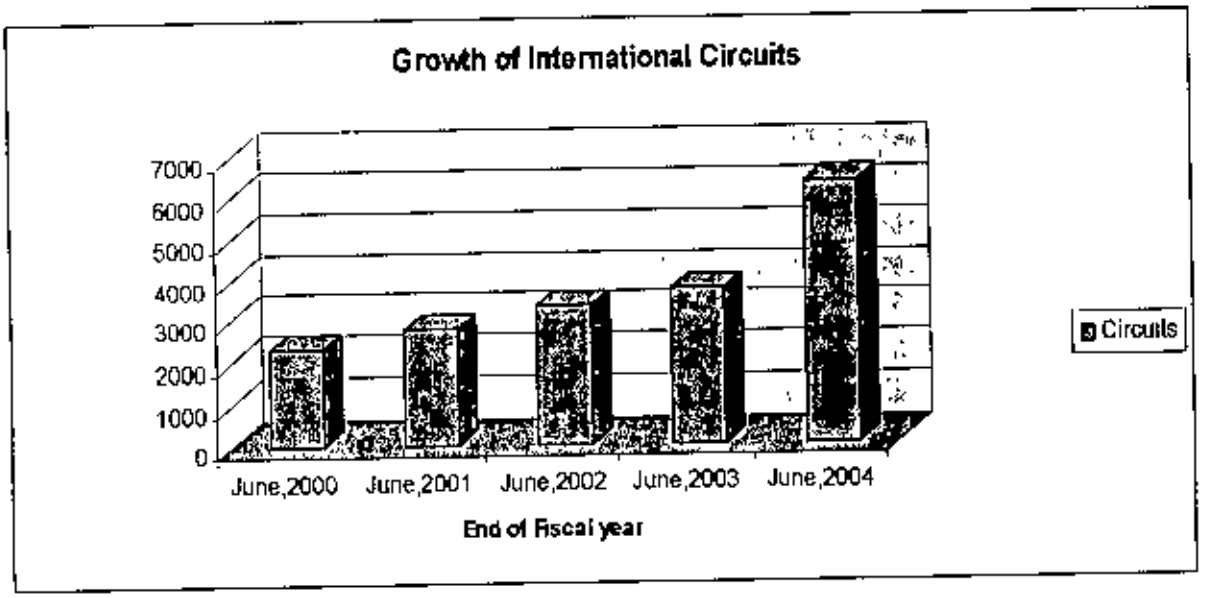


Figure 6.5

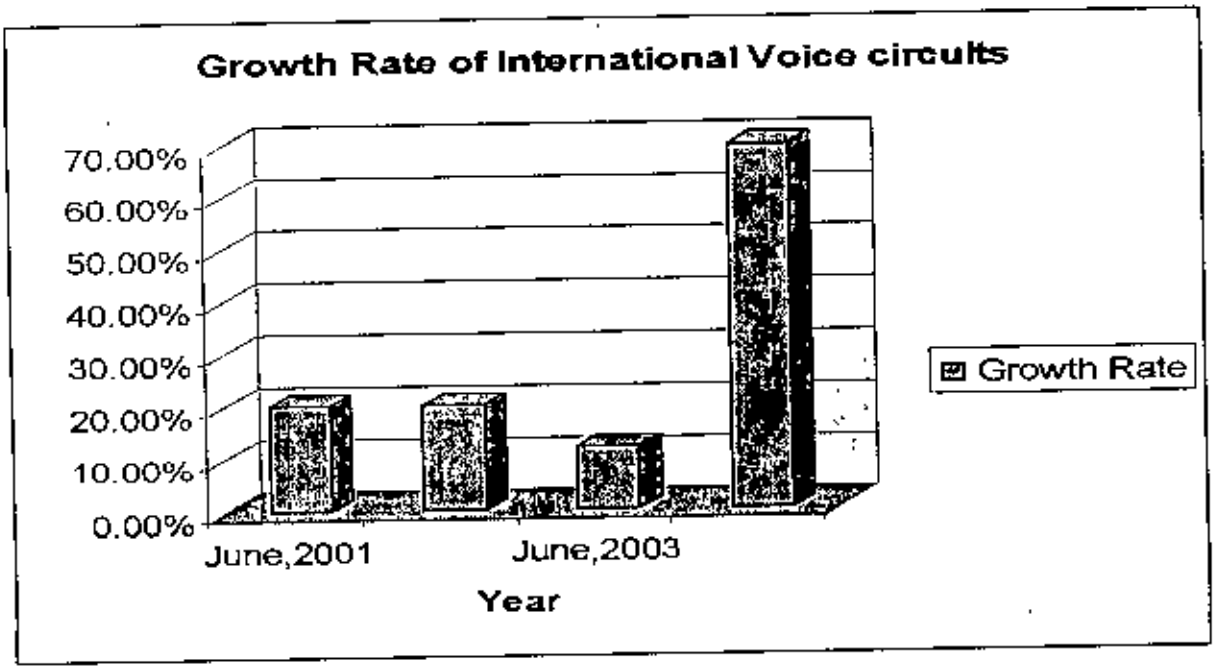


Figure 6.6

6.9 Human Resources Development (HRD) activities of BTTB

As the basic operator for telephony, overseas carries and transmission network BTTB has common responsibility to keep peace with the tremendous development and globalization of telecommunication and information technology. Human Resource Development (HRD) is very essential for this purpose.

To enhance the efficient and quality of services of Bangladesh Telegraph and Telephone Board, to update the technical knowledge and skill of personnel and to install new technology in the Telecom sector special emphasis is given to the in-service training activities. In service training for newly recruited engineers and refresher training of other officers are carried out in Telecom. Staff College (TSC), Gazipur and that for the employees are usually carried out inj Telecom Training Centers (TTCs) located at Dhaka, Bogra and Khulna and in other sub-centers.

The Telecom Staff college (TSC) at Gazipur (near Dhaka) established in 1987 with ITU (International Telecom Union) and UNDP (United Nation Development Program) assistance has already put its marks as one of the leain institutes for telecom, training in this region. It has all the infrastructural facilities and equipment including resources to establish itself as the regional training centre.

47 officers and officials of Bangladesh T & T Board received foreign training in about 19 different Courses in Telecom and relevant subjects in the year 2003-2004 *[Ref.1]*

Table 6.7: Training and Courses Conducted By BTTB in fiscal year2003-2004

Courses Conducted in TSC

Sl. No.	Name of Courses	No. of Participants	Duration of the course
	Regular Course		
1	ADF/Batch, 2003	39	02 Years
	Refresher Course		
1	Inter system and BTTB's network	08	01 Day
2	Inter system and BTTB's network, 2nd Batch	13	01 Day
3	Information and Communication Technology	16	02 Days

Training in TTCs

Sl. No.	Category of Courses	No of Courses	No. of Participants
1	Regular Courses	14	818
2	Refresher Courses	10	11
	Total	24	929

(Source: Annual Report 2003-2004, BTTB, Page26,27)

6.10 Supplement &Value Added Services

Some supplement and value added services are mentioned here those are in built in almost every switching system .Of them all are not open for subscriber. But it is possible to give those facilities more or less. The newly installed Mercury switching have all this facilities strongly.

Locking

A subscriber can separately lock his local, NWD or ISD call.

Call restrict code----- *34*password in 4 digit*01# (for all call)

*02# (for NWD and ISD)

*03# (for NWD only)

*04# (for ISD only)

*05# (for local call only)

Abbreviated dialing (ABD)

This service is a function of designating abbreviated number of 1 or 2 digits (01~20) for number often used or long number of the other and of calling the other by the abbreviated number. Pick up the handset and hear dial tone, press the abbreviated number and then call is established to the called number corresponding to the abbreviated number of the system. Up to 20 abbreviated numbers can be used and the corresponding called numbers range up to 16 digits.

Call waiting (CAW)

Call waiting is a function that when a subscriber is in busy state, if a call is terminated from the third party, sends normal ring back tone to the third party without sending busy tone indicating that the called subscriber is busy. And the function informs the busy subscriber through signal tone that a new call is terminating. After hearing signal tone, if he does not answer within 15 seconds, signal tone is repeated for 4 seconds.

If the subscriber hooks flash to make a call to the third party, the existing other party transits into holding state and hears holding tone and can be connected to a new terminating call to answer the call. If he wants to talk to the existing party again, he can hook flash. By repeating this procedure, the subscriber can alternate two calls.

Call waiting rejected (CCW)

This is a function that a subscriber registered in call waiting function can reject one call to prevent cal waiting function while in busy state. The subscriber can register call waiting rejected function by dialing special code before starting a call, and can make a normal call by dialing the desired subscriber's number while hearing registration conformation tone. Even in busy state, the subscriber can prevent call waiting function for the current call by holding the other and sending special code, using hook flash.

Three way conferencing (TWC)

This is a function that three persons can talk to each other in a way that a currently busy subscriber holds the currently busy party using hook flash to call the third party and then again by hooking flash, calls the subscriber in holding state.

Conference calling (CC)

Conference calling is a function that 6 persons can talk to each other at the same time. Call method is same as three way conferencing.

Call reattempt (REG)

In case a subscriber dials to call but the called party is busy, by hooking flash and reserving the number using code, the switching system connects the call automatically when the called party is idle by verifying the status of the called party every certain interval for a certain number of times.

Waiting direct call (WML)

If a subscriber with WML function has registered waiting direct call using code and called number, if the subscriber picks up his handset and waits for waiting time (5 seconds), call is automatically terminated to the designated subscriber. If he starts dialing before waiting time (5 seconds), he can make an originating call in the same way as normal calls.

Call holding (CHD)

This is a function that after holding the current call, you can make another call. By hooking flash while busy and sending to switching system, you can hold the other in busy state and make a new call, and can talk to the other again, using hook flash.

Call transfer (CTR)

This is a function that, in called busy state, the subscriber holds the current calling subscriber and connects him to the third party by calling him. This service is possible only in case of terminating call.

Call forwarding (CFW)

A subscriber with call forwarding function can forward a call terminating to his number to another desired subscriber. Call forwarding is classified into unconditional forwarding and conditional forwarding. If the subscriber B with call forwarding function has forwarded call to the subscriber C, when a subscriber A dials to B, in case of unconditional forwarding, C is called out unconditionally without regard to the status of the subscriber B.

In case of conditional forwarding, when the subscriber B is busy or does not answer for more than no-answer time (15 seconds), the call is forwarded to the subscriber C. after call forwarding, in case the subscriber C is in abnormal state, the call is processed as abnormal in the same way as normal call. In case the subscriber with call forwarding makes an outgoing call, he hears special dial tone indicating that call forwarding is currently in service and after this, the call is processed in the same way as normal call.

Call restriction by subscriber (CRU)

This is a function that the subscriber can restrict originating call using designated specific code. If this service is initiated, switching system checks if the call is within a range of call restriction for all calls generated from the relevant line and if the call is beyond the range, it sends congestion tone or recorded announcement indicating that call cannot be originated. This function does not affect terminating call.

Wake Up service (WKP)

If a subscriber wants a wakeup service, he can register a desired time within 24 hours from the present time. When the designated time arrives, switching system sends call signal (ring) to the subscriber telephone and if the subscriber answers, he can hear recorded announcement announcing 'designated time'. By the subscriber's choice, wakeup service can be serviced one time or repetitively by registering one time.

Code for alarm ----- alarm activation *55*time# second time. Alarm deactivation #55#

Selective call restriction (SCR)

In case a call is terminated from a specific subscriber, if the subscriber registers a number by being busy or making an originating call, afterward, terminating call can be rejected by connecting the call terminating from the specific subscriber to announcement device without connecting it. A maximum of 10 subscribers can be registered and registered subscribers can be verified by announcement device or code and originating number.

6.11 Other Progress

There are some other ongoing improvement in some exchange in BTTB such as

- Creating computerized Data Base for subscriber (In Uttara Exchange data base has been made successfully)
- Trying to computerize the management and accounting system
- CCTV has been introduced for security purpose in some exchange such as Uttara Exchange, Mohakhali ITX etc.

CHAPTER 7

INDICATION OF POSSIBLE IMPROVEMENTS.

7.1 Some possible improvements determined by the BTTB authority

On the topic titled "Determination of Working Policy of BTTB" few meetings were held in BTTB during middle of the year 2005. The future plans for the improvement of the service quality and overall service was discussed elaborately on those meetings. *[Ref.16]*
According to the document of the meeting following strategic and technical decision wee taken to improve the performance and service quality of BTTB.

7.1.1 Administrative Section

- Arising more Discipline
- Faster file processing
- Increase organizational ability (Restructuring, Computerization)
- Accelerating the process of filling up the vacancies and promotion.
- Accelerating the process for pension case
- Modernization of training system.
- Importance o9n cleanliness beautification.
- Making the rules and regulation appropriate
- Increasing the awareness about the interaction with people and press

7.1.2 Maintenance & Operation section

For the better and secured maintenance and keeping the telecommunication service of BTTB smooth more importance should be given to the following activities

- Customer Service (Development of One Point Service, Quicker Telephone Connection and Investigation system)
- Fault Management and Reporting (Immediate repairing, SSI Cell, Camp and fault management)

- Maintenance System (Maintenance Policy, Optical Network, Modern Information Collection, Modern tools collection, Inspection, Power and Earthin, OMC, Cleanliness)
- Security of the Buildings and Plants (Land, Wall, gate, Fire extinguisher)
- Monitoring the buildings and plants (Traffic observation, Ascertainment of Demand, Proposal of project and Replacement, Access network)
- Marketing Management(Preserving data of the assets, Protecting the fraud revenue collection, Interconnection, Marketing of Channel i.e. E1 and data, Establishing marketing sub-division, Introducing new features and value added services)
- Observation of the progress of the private operator and combination(Establishing Inter-relation sub division)
- Removing old and unused equipment.

7.1.3 Planning & Development Section

For making the development program more effective importance should be given to the following topics:

- Project should be taken according to the demand of M & O Division and Annual repot
- Regularly discussing the advancement of project implementation, Establishing Monitoring Cell (Project Control)
- Establishing standardization Cell, Improving the Tender policy
- Following the rapid change of Technology (IP, Convergence, Broadband Access network)
- Establishing Central Data Cell under P & D Division

7.1.4 Finance & Accounts Sections

- Making budget logical and maintaining financial discipline
- Increase Revenue income (Ledger update, Corporate revenue, Improving Billing System and Protecting the corruption)
- Consciousness in collecting revenue from International calls, Making and sending accounts rapidly.
- Traffic Monitoring, Increasing new tariff and correcting traffic
- Making the accounts of assets up-to-date.

7.1.5 Security Activities

- Preparing rules and regulation for security purpose
- Arrange more monitoring system (CCTV)
- Arrange Training on security purpose.

7.1.6 Others

The other mentionable points for the improvement of service of BTTB those have been proposed and discussed by the officers of BTTB on that meeting are given below:

- It is necessary to prepare a Mission Statement for the improvement of BTTB service and activities
- Arranging commercial selling of various assets of BTTB such as E-1,Optical Fiber Cable etc
- Giving more importance to modernization of revenue management system.
- Controlling revenue misuse with the help of special software and necessary technology.
- Increasing the interconnection with mobile operators. It can be possible to terminate private operators into a common point for terminating them into Mohakhali ITX
- Preparing Performance Indicator of each exchange by making revenue statement.
- Spreading Optical Fiber Network at the level of Upazilla to achieve the benefit of Submarine Cable.
- After completion of Submarine cable project Bangladesh will initially get 10 Gbps whereas present capacity is only 200 Mbps. On that revised condition, excess capacity can be sold . but it is necessary to careful about not to drain out the BTTB's revenue by selling of excess capacity
- To solve the OSP (Out Side Planning) problem, high capacity can be used in replacement of usual duct..
- To increase the capacity of transmission link SDH equipment should be used in replace of PDH equipment
- Along with voice service other services such as Data, Video, and IPTV etc will be introduced in BTTB. For this Optical trunk and Access network will be established properly

7.2 Some Possible improvements in respect of the survey conducted by the author

- A Phone Directory should be published for each exchange. So that people can find out a person easily with the help of that Phone Directory. In this respect 77 % subscriber gave their opinion positively ..

Table 7.1: Survey Result on Phone Directory

Proposition(Q-28)	Opinions	Subscribers opinion in Percentage
BTTB should publish a phone directory of all the subscribers and should sell to the subscribers	Yes	77 %
	No	2 %
	Don't know	21 %

- To relief from unwanted disturbance from unknown telephone Caller ID facilities should be implemented in every digital telephone .73% of Subscribers demanded for it in survey.

Table 7.2: Survey Result on Caller ID

Proposition (Q-20)	Opinions	Subscribers opinion in Percentage
BTTB should provide Caller ID facilities to all the subscribers	Yes, by any means	73 %
	If possible economically	21 %
	No comments	6 %

- In survey at least 75% subscriber complained against line man for his illegal activities outside the exchange. If there objection was true the authority should give proper attention on that matter for the better service of BTTB in the ongoing competitive situation

- In survey several subscriber gave opinion that subscriber should have easy access to meet with the high or Mid level management (ADE, DE, GM) not meet with the line man or Sub Assistant Engineers
- For giving better Service BTTB should establish customer care centre for assists with 24 hour help line in every each exchange)
- The operator assisted calling facilities in case of ISD call with non ISD phone should be improved.

Table 7.3: Survey Result on Operator assisted calling

Comment	Opinions	Subscribers opinion in Percentage
BTTB provides facility for operator assisted calling.....	Sufficiently	9 %
	Insufficiently	43 %
	Conditionally	26 %
	Not easily	22 %

- Online telephone bill should be given to subscriber the telephone bill should be available in Internet
- More value added service should be provided
- Prepaid connections should be given
- There is complain that some influential subscriber do not pay huge bill. If it is true then necessary steps should be taken for the collecting those revenue in time.

7.3 Reduce or Remove Call Termination

The government, especially Bangladesh Telecommunication Regulatory Commission (BTRC) - the country's telecom regulatory watch dog - should take immediate measures to shut down these 'grey operators' to stop the huge revenue losses incurred by BTTB. Without stooping call termination BTTB will gradually lose more and more revenue which will be very dangerous for BTTB.

CHAPTER 8

DISCUSSION & CONCLUSION

8.1 Discussion

From the analysis of service quality and survey it seems that the service quality of BTTB is not up to the mark. According to survey very few (only 9%) subscribers are not satisfied with the service of BTTB at all. But the same survey shows that 45% subscribers are also not satisfied to their expectation. So improvement of the service quality of BTTB is an essential phenomenon. The results of survey also show that the subscribers are not much worried about the present billing system. More than 70% customers think that the local and NWD call rate, that are charging now, are more or less economical and reasonable. In case of billing accuracy and regularity of getting billing copy more than 70% subscribers are satisfied .More tan 80% subscribers are satisfied with BTTB's network performance .But most of the customer gave objection in case of slow response of fault repairing and dilemma of getting new connections. Around 70% subscribers have objection with the unfriendly nature of employees of BTTB

Survey shows that there is some mismanagement in its customer service. But the overall network quality is not much low. So BTTB mainly needs to improve its customer oriented services. At the same time BTTB should up to date its technology with the improvement of lates technology For this the management and planner of BTTB should be more active and innovative. Telecommunication sector is flourishing very rapidly in the country. So to cope with this race BTTB has to reach highest quality of service not less than that.

According to the essence of the survey and the previous discussion we could summarize that the following possible activities are needed for improving BTTB's service quality for both the case of customer service and technical operation to hold the previous reputation of BTTB.

1. Increasing organizational ability
    - Internal reformation

- Setting up sells and marketing department
- E-Governance
- Modernization of Training
- Fulfilling all the vacancies as early as possible to give prompt service.

2. Improving customer service
    - Expansion of one point service i.e. setting up more customer care centre.
    - Modern data base management
    - More helpline for rapid assistance
    - Online Billing
    - Easy and faster policy to get new telephone
    - Reducing tariff in compare with other operator
3. Fulfilling the demand of Telephone and improving the infrastructure
    - Setup more Exchanges
    - TAX(Trunk automatic Exchange)/ ITX expansion
    - Setup and expansion of Optical Backbone up to Upazilla .
    - Set up of modern Optical and Wireless Access Network
    - Set up VOIP and Inter connection platform
    - Improvement of security system
    - Training input
    - Increasing Marketing personnel
    - Removing old and unused equipment
4. Developing the training facilities
    - Modernization of Telecom Stuff College(TSC)
    - Modernization of Telecom Training Centres (TTC)
    - Training on Computer, marketing and new technology
    - Arranging more foreign training for employees on recent developed technology
5. Implementation of modern marketing policy
    - Starting commercial activities
    - Set up Marketing Department
    - Give more importance on marketing data and video service
    - Implementing the use of CCTV through BTTB network
6. Improvement of the system of collection revenue

- Modernization of Ledger management
- Removing the corruption and misuse of revenue
- Improving the policy of collecting revenue from international call

7. Improvement on technology
    - Adaptation of IP, soft Switch technology.
    - Giving Caller ID facility
    - Giving more supplementary and Value added service to customer
8. Other improvements sector
    - Necessary arrangement for remove or reduce call termination problem
    - Find out any corruption and solving it.
    - Introducing Prepaid telephone system
    - Restructuring or Privatization of BTTB to relief BTTB from the policy dilemma of government

One thing should be mentioned here that the all the data, mentioned in this thesis, show that BTTB has already realize the challenge of its existence not only as a leader but also as a simple telecom operator as in every section BTTB are seem to be more active now a days.

The comparison of total revenue collection of BTTB for the year 2002-2003 and 2003-2004 is shown in the table 8.1. This table depicts that BTTB is a profitable organization of government. The decrease of revenue in the year 2003-2004 is due to the immense competition, huge illegal call termination and the decrease rate of different calls. But it is noticeable that the decrease is not much in respect of those difficulties.

Table 8.1: Revenue Collection and Revenue Receivable

Description	Taka in Million	
	2002-2003	2003-2004
Receivable amount as on opening day of fiscal year	6475.46	5059.43
Bills in issued during the fiscal year	14031.97	16419.40
Total receivable amount during this year	20507.43	21478.83
Actual receipt in the year	15448.00	15311.47
Receivable amount carried over to the opening day of next fiscal year	5059.43	6166.36

(Source: Annual Report 2003-2004, BTTB, page 24)

Thus for maintain at least this revenue income BTTB should improve its condition in every step to cope with the growing infrastructure of telecommunication in Bangladesh.

Every year capital is invested through national Annual Development Program (ADP) of the government for the projects which creates fixed assets for BTTB The annual Development Program for the year 2003-2004 and the actual amount spent under this program for eighteen projects are furnished in Table 7.2..

Table 8.2 : BTTB Investment in 2003-2004 through ADP on 16 projects

(Taka in Million)

Item	Local Currency	Foreign Currency	Total
Allotment	3919.90	192.50	4122.40
Expenditure	3359.57	155.08	3514.65
Surplus	560.33	37.42	597.75

(Source: Annual Report 2003-2004, BTTB, page 25)

Table 8.2 shows that BTTB gets huge amount for the development program. So it is not impossible to improve the condition of BTTB greatly. If BTTB wants to improve its quality really, BTTB can do within a short period. But for this the Government should also give necessary efforts as BTTB is an Government organization still today.

8.2 Conclusion

The extensive range of application of telecommunications and computer technology in our life has brought the people of the planet earth closer and made the idea of global village a reality. The concept of Global Information Infrastructure facilitating the information flow from the largest city to the smallest village on any part of the earth and beyond is no longer a fantasy of the idle mind. The spectacular and sensational advancement in the information and communication technology has stretched out its predominance in almost every aspect of our life, our agriculture, education, industry, trade, sports, culture, politics, war and any other matter that one may think of.

A sound telecommunication policy is essential to develop the national telecommunication infrastructure which supports the economic emancipation and ultimate welfare of the people by ensuring facilities on demand, assuring satisfactory quality of service and providing value for the money to the consumers. The well-expressed policy of the government acts as the prime mover to start the wheel rolling. The development of policy guidelines regarding the extent of private sector participation, competition among the operators both state owned and the private, inter-working relation between the operators, tariff structure etc are the matters to be addressed explicitly and unambiguously.

Before the beginning of the last decade or so of the twentieth century, the telecommunication scenario in Bangladesh like many countries of Asia and Pacific region was characterized by state-owned monopoly situation. The telecommunication industry in almost all of the countries of the world, with the exception of a few, used to be the exclusive affair of the Government. The Government single-handedly performed the role of the operator of telecommunication services as well as that of the regulatory authority in addition to its being the functionary of policy-making affairs. However, the policy makers in the telecommunication administration of the country, in line with the thinking of many others of the region, had growing awareness to part away with the responsibilities of both the operation and regulation of telecommunication systems and services and make way for private and independent entities respectively in place. The domineering need of reform in the sector leading to greater emphasis on the market oriented conception and creation of competitive environment, was the driving force behind this change. This led to privatization of a number of telecommunication administrations owned and

managed by Government in one hand and emergence of multitude of privately owned operators A Master Plan will be prepared for expansion and development of telecommunication services in the country so that Bangladesh can reap full benefits of information technology revolution.

In Bangladesh before establishing the National Telecommunication Policy 1998 BTTB had strong monopoly power in the field of fixed telephone (PSTN) and in overall telecommunication also. So the concept of Service Quality was not so important. According to the NTP of 1998, The Bangladesh Telecommunication Regulatory Commission (BTRC) was established on January 31, 2002 under the Government of the People Republic of Bangladesh and thus the regulatory power has been ceased from BTTB. On the commencement of the Bangladesh Telecommunication Act, 2001 BTTB became and operator like other private operators and has to be corporatise within few year. Already BTRC has given license to not less than 15 private operators for running PSTN business in the country. So there are so many competitors for BTTB now a day. Along with this Telecom act,1998 says that as a long term strategy, development of telecom infrastructure and services in all the fields are to be opened up for private participation after the year 2010 and if needed , this can be opened up earlier than the year 2010. Customer will accept and choose that operator whose quality of service for both the case of customer service and network performance is better. Desides PSTN operators there are five mobile phone operators are in operation with quite improved service. Although mobile phone is not actually a substitution of fixed line, due to low capacity, unavailability and unimproved quality of BTTB that would be happened. So there comes a great challenge for BTTB for its existence not only as a leader but also a ordinary operator.

Thus BTTB should evaluate its service quality and performances strongly and at least introduced the necessary improvements so far discussed in the thesis. BTTB should be determined that teledensity will be 10 telephones per 100 population within the first quarter of 21st century. With that aim BTTB should improve its service quality as much as needed and that will be the only way for Bangladesh Telegraph and Telephone Board to survive as the leader of telecommunication of Bangladesh

BIBLIOGRAPHY AND REFERENCES

1. Annual Report 2003-2004, BTTB.
2. BTTB Telephone Index 2005, BCS Telecom Association,
3. Annual report 2001-2002, BTTB
4. Richard B. Chase, Nicholas and F. Robert " Production and Operation management", eighth edition, McGraw-Hill
5. Parasuraman, Leonard L. Berry, & Valarie A. Zeithaml, "A Conceptual Model of Service Quality and its Implications for Future Research," Journal of Marketing 49 (Fall 1985), Page 41-50.
6. Peter Hernon and Ellen Altman, Assessing Service Quality: Satisfying the Expectations of Library Customers (Chicago: American Library Association, 1998), Page8.
7. Brinley Franklin and Danuta Nitecki "USER SATISFACTION WHITE PAPER" April 6, 1999, http://www.arl.org/libqual/geninfo/usersatisfaction.pdf on date 31/10/2005
8. http://www.bangladesh-web.com/news , date 30/11/2005
9. http://www.bttb.net.bd , date 30/11/2005
10. Pulse Code Modulation Systems handbook, Telecom Staff College, BTTB, Gazipur, May1989
11. Manual of Synchronous Digital Hierarchy,Alcatel, Alcatel University (Lannion / Stuttgart) 8AS 90101 0009 WBZZA Ed.07 09/2002
12. Manual on DTS-4000 System Structure, Mercury Corporation
13. http://www.bangla2000.com , date 29/11/2005
14. http://www.pmo.gov.bd/wpeeng/submarine.htm, date 20/11/2005
15. http://www.bbsgov.org/ffyplan/308.html, date 30/11/2005
16. Office order of the meeting on "Determination of Working Policy of BTTB" with reference no.-S,BTTB-Miscellaneous/2003-04/84 published and circulated on 15/09/2005
17. http://www.dgt.gov.tw/English/Regulations/dgt41/Fixed-Service-Quality.shtml, on date
18. The Financial Express, June17, 2003

19. http://www.public.iastate.edu/~swathi/DimensionsofServiceQuality.htm, on date 31/11/2005

20. http://www.aptsec.org/meetings/2005/PRF05/docs/PRF-05-ID Bangladesh%20Telecoms%20Reg.doc , on date 31/10/05

APPENDIX A

SURVEY QUESTIONER

This is a survey questioner based on different parameters of **service quality** regarding telecommunication which will be helpful for studying the present status of quality of service of BTTB.

Answering the questions below should only take a few minutes. Your participation is completely voluntary and will help me to complete my thesis properly.

Please put tick (√) mark on your preferred opinion.

1. As a telephone subscriber/user of BTTB you are .....

a) **Fully satisfied**
b) **Satisfied**
c) **Less satisfied**
d) **Not satisfied**

2. Do you think BTTB is reliable?

a) Yes.
b) No.
c) No comments
d) Should be more reliable

3. Are service provided without disturbance, noise or error?

a) **Yes, generally all-time**
b) **Yes, satisfactorily**
c) **Not all-time**
d) **Never**

4. The technology used in end user side i.e. in customer premises for making a call and communicate with others is(i.e. understanding different tones and calling system) .....

a) User friendly
b) Problematic
c) Difficult
d) Not suitable for all

5. When there is a problem, is it resolved quickly?

a) **Resolved as early as possible.**
b) **Solved but need much time**
c) **Depends on extra payment**
d) **Never solved**

6. Are employees willing to answer your questions?

a) Yes.
b) Sometimes.
c) No comments
d) Never

7. Do you think BTTB has sufficient well and capable technicians and engineers to provide prompt service?

a) **Yes**
b) **No**
c) **Don't know**

8. The employees of BTTB are more or less .....

a) Friendly and try to help as much as possible
b) rude and always acting busy
c) no comment
d) very strict in rules and regulation

9. Does BTTB provide its service with proper credibility & honestly?

a) **Yes.**
b) **No.**
c) **more or less**

10. Is the BTTB telephone service secures from cross connection, wrong number connection or illegal line connection?

a) Yes.
b) Not sure
c) Not fully.
d) No

11. How easy is it for you to talk to an employee when you have a problem or any question regarding your telephone?

a) **easier**
b) **Not easier.**
c) **help line is very friendly**
d) **No helpline**

12. In BTTB at present the charge for a local call is Tk 1.5 /pulse (excluding VAT) and one pulse means five(5) minutes for peak time and seven(7) minutes for off peak time.. It is……..

a) Costly and not appropriate
b) Not costly and appropriate
c) Economical & reasonable
d) No comments

13. In BTTB at present the charge for a NWD call is Tk 4.5/Minute for peak time and Tk. 3.00/minute for off peak time. It is……..

a) Costly and not appropriate
b) Not costly and appropriate
c) Economical and reasonable

14 Is multi metering system better then non multi metering system?

a) Yes
b) No
c) No comments

15. BTTB considers below 100Km as Local call and above 100Km as NWD call all over the country now a days. BTTB also considers 8 AM to 10 PM as Peak Time and rest of the time as Off Peak Time. These both considerations are……..

a) Right
b) Wrong
c) Re considerable
d) No comments

16. Do you get your bill accurately?

a) Yes, always.
b) No.
c) Most of the time
d) sometime

17. Do you get your copy of billing regularly and in time?

a) Yes
b) No.
c) some time
d) Not sure

18. Can you pay your phone bill easily?

a) Yes.
b) No.

19. Do you think BTTB consider the needs of subscriber and try to give prompt service?

a) Yes.
b) No
c) Don't know

20. Should caller ID facility be given to all subscribers?

a) Yes, by any means
b) If possible economically
c) No comments

21. Do you think BTTB is a profitable organization of Government?

a) Yes
b) No
c) Don't know

22. Do you think BTTB telephone is better than any other way of telecommunication in respect of speed, accuracy, availability of connection, accuracy and simplicity?

a) yes
b) No
c) Not sure

23. The network performance of BTTB is ……..

a) Very well
b) Faulty
c) Sometime well sometime faulty
d) Don't know

24. Do you know all the facilities provided by the BTTB such as NWD, ISD, Economy ISD, Call Forwarding, call conferencing, wake up service, Locking, Telex, Internet etc?

a) Fully
b) Most of them
c) A few
d) Don't know

25. The procedure for getting a new telephone connection is …….

a) Easier & systematic
b) Very difficult and lengthy
c) Not clear enough to customer
d) Full of corruption

26. The capacity of telephone lines of BTTB is ……

a) Very Poor
b) Poor
c) Sufficient

27. Where there is no facility for direct calling such as the ISD call from non ISD phone, BTTB provides facility for operated assisted calling……..

a) Sufficiently
b) Insufficiently
c) Conditionally
d) Not easily

28. Do you think that BTTB should publish a phone directory of all the subscribers like other countries and should sell to the subscribers?

a) Yes
b) No
c) Don't know

29. Do you think that BTTB should provide more value added services like SMS, MMS etc and make proper advertisement for existing unknown Value added services and give advertise of the existing services?

a) Yes
b) No
c) No comments

30. For providing better quality of service, privatization of BTTB is necessary.

a) Yes.
b) No
c) Not now, later on
d) No comment

31. If you have any comments on the service qualities of BTTB please write down in short.....

32. What should be the most important step to take for the improvement of the service quality of BTTB?.....

APPENDIX B

Sample Rates for BTTB's Data and Internet Services

❒ Sample DDN Charges for Nationwide circuit

[A] Registration Fee (Tk.)

	64 kbps	128 kbps	256 kbps	512 kbps
Old charge	10,000	10,000	10,000	10,000
New Charge	**5,000**	**5,000**	**5,000**	**10,000**

[B] Installation and Testing Fee (Tk.)

	64 kbps	128 kbps	256 kbps	512 kbps
Old charge	20,000	20,000	20,000	20,000
New Charge	**15,000**	**15,000**	**20,000**	**20,000**

[C] Yearly Rental (Tk.)

	64 kbps		128 kbps		256 kbps		512 kbps	
	Old	New	Old	New	Old	New	Old	New
Dhaka-Chittagong	3,38,000	1,10,000	6,08,400	1,91,000	10,47,800	3,18,000	16,22,400	6,17,000
Dhaka-Bogra	2,22,000	82,000	3,99,600	1,41,000	6,88,200	2,34,000	10,65,600	4,50,000
Dhaka-Comilla	1,85,000	64,000	3,33,000	1,09,000	5,73,500	1,80,000	8,88,000	3,45,000

❒ Sample DDN Charges for Multi-exchange area circuit

[A] Registration Fee (Tk.)

	64 kbps	128 kbps	256 kbps	512 kbps
Old charge	10,000	10,000	10,000	10,000
New Charge	**5,000**	**5,000**	**5,000**	**10,000**

[B] Installation and Testing Fee (Tk.)

	64 kbps	128 kbps	256 kbps	512 kbps
Old charge	15,000	15,000	20,000	20,000
New Charge	**15,000**	**15,000**	**20,000**	**20,000**

[C] Yearly Rental (Tk.)

	64 kbps		128 kbps		256 kbps		512 kbps	
	Old	New	Old	New	Old	New	Old	New
Motijheel-Gulshan	80,000	24,000	1,44,000	36,600	2,48,000	60,000	3,84,000	102,000
Motijheel-Uttara	99,000	33,000	1,78,000	47,400	3,06,900	78,000	4,75,000	138,000
Motijheel-Kawranbazar	72,000	21,000	1,29,600	31,200	2,23,200	51,000	3,45,600	84,000

1. No security deposit
2. 25% discount on total rental charges for Accredited Universities, Colleges, Madrasa, Training and Research Institutes, Government/Semi-government/Autonomous and Non-profit Research organizations
3. 25% discount on rental charges for Software Incubators and Parks under Government control and Private Software exporters earning at least USD 100,000 per year
4. 50% discount on Registration, Installation and Testing Fee for 5+ connection at a time
5. Initial payment for 6 months
6. Transmission of voice in any form is not normally allowed. This will need prior approval of BTTB and an annual fee @50% of the annual circuit rental shall be applicable.

☐ Sample Charges for Leased Internet Access (High Speed Internet)- Available at 41 Districts

[A] Registration Fee (Tk.)

	64 kbps	128 kbps	256 kbps	512 kbps
Old charge	10,000	20,000	40,000	40,000
New Charge	10,000	10,000	10,000	15,000

[B] Installation and Testing Fee (Tk.)

	64 kbps	128 kbps	256 kbps	512 kbps
Old charge	10,000	10,000	10,000	10,000
New Charge	10,000	10,000	15,000	15,000

[C] Yearly Rental (Tk.)

	64 kbps	128 kbps	256 kbps	512 kbps
Old charge	4,80,000	7,48,000	11,86,000	18,88,000
New Charge	2,08,000	3,18,000	4,56,000	8,10,000

7. No security deposit
8. 50% discount on total rental charges for Accredited Universities, Colleges, Madrasa, Training and Research Institutes.
9. 25% discount on rental charges for Government/Semi-government/Autonomous and Non-profit Research organizations
10. 25% discount on rental charges for Software Incubators and Parks under Government control and Private Software exporters earning at least USD 100,000 per year
11. Initial payment for 6 months
12. 50% discount on Registration, Installation and Testing Fee for 5+ connection at a time

❒ BD Domain Name Registration

	Registartion Fee	Service Charge	Renewal Fee
Old charge	1000	1500 for first year	1500/year
New Charge	**1500 for two years**		**500/year**

❒ E1 Access charge to PSTN from ISP

	E1 Port Charge	Media (Local loop) Charge	Total
Registration Fee	Tk. 10,000	Tk. 5,000	Tk. 15,000
Installation and Testing charge	Tk. 30,000	Tk. 30,000	Tk. 60,000
Annual rental Charge	Tk. 60,000	Tk. 48,000	Tk. 1,08,000

. **Registration, Installation and Testing Charge are one time and non-refundable**
. The charge does not include Customer Premise equipment (CPE) at Customer end

Migration Plan for E1

For surrender of 30 telephones by ISPs against E1 connectivity, Total Installation and Testing charge (Tk. 60,000) shall be exempted.

❒ Post-paid Dialup

[A] No Use No Pay Package

	Old Charge	New Charge*
Registration Charge	Tk. 1000	**Tk. 500**
Free Use	1000 Minute	**800 Minute**
Peak-hour usage charge	50 paisa/min	**40 paisa/min**
Off-peak-hour usage charge	30 paisa/min	**25 paisa/min**

New Peak-hour 10:00 AM to 12:00 Midnight

[B] Unlimited Package

	Old Charge	New Charge*
Registration Charge	Tk. 1000	**Tk. 500**
Monthly Charge	Tk. 6000	**Tk. 1800**

*Effective from 1 November, 2005

❒ More New Packages !!!!!

Package	Registration Charge	Usage time	Monthly Charge	Charge/min
EduCare (Only for School, College & Madrasah)	Tk. 100	08:00-18:00	Tk. 500	3 paisa
OfficeMate (Only for Official customers)	Tk 500	08:00-18:00	Tk. 1200	6.5 paisa
OfficePack (Only for Corporate Customer having 50+ connections)	Tk. 100	09:00-17:00	Tk. 900	6 paisa

Use under these packages is unlimited

*(Source: **http://www.bttb.net.bd** date 30/11/2005)*

APPENDIX C

❒ Cost for Getting a New Telephone Connection

Connection fee	7,200 Tk.
Fitting charge	500 Tk.
Deposit	2,000 Tk.
Line rent for two month	300 Tk.
Total	10000 Tk.

❒ Various rate regarding Connection of Telephone

According to the Notice Published on the date of 07/07/2005 from Ministry of Post and Telecommunication (MOPT) with reference NO- PT?SECTION-5/4-11/98(Part)-209 the rates are as below

Sl.	Name of The Service	Present Rate	Re defined rate/ Proposed Rate
Decision (1)	Transfer fee (digital/Analogue):		
(a)	Out side transfer(Within same area code)	2,500 Tk.(Including 500 Tk. as fitting charge)	2,500 Tk., (Unchanged) (Including 500 Tk. as fitting charge)
(b)	Inside transfer(within same Building)	650 Tk (Subscriber will give Fitting charge-500 Tk)	650 Tk (Unchanged) (Subscriber will give Fitting charge- 500 Tk)
Decision (2)	Telephone Re-Connection Fee:		
(a)	Reconnection of Permanently disconnected Telephone(After 59 days to 1 year)	7,500 Tk. (Connection fee and the rent of disconnected time can be receivable)	Dhaka & Chittagong Multiexchange area - 2500 Tk Division/District-2000 Tk. Upazilla/Growth centre - 1500 Tk. Analogue/Auto/magneto/CB - 1000 Tk (Connection fee and the rent of disconnected time can be receivable)

Decision (3)	Fee for changing name of the subscriber, Name of the organization and number:		
(a)	In same address royalty will not be changed but name/ designation will change	5,000 Tk.	1,000 Tk
(b)	(Person/Organization): Keeping same address ownership of Org. will change / Telephone subscriber will change	5,000 Tk.	Dhaka & Chitta. – 4,000 Tk. Division/ Dist – 3,000 Tk. Upazilla & Growth centre - 2,000 Tk
(c)	The telephone of a living sub. will transfer after the name of his/her Son, Daughter/ Husband/Wife	2,000 Tk.	1,000 Tk.
(d)	The telephone of a dead sub. will transfer after the name of his/her Son, Daughter/ Husband/Wife	500 Tk	500 Tk
(e)	Number changing fee	5,000 Tk.	2,000 Tk.

(source: Notice of MOPT, Reference No- PT/SECTION-5/4-11/98(Part)-209)

THANK YOU